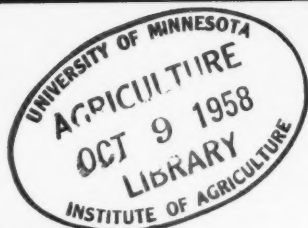


OCT OBER

# Farm Chemicals



## High Clearance

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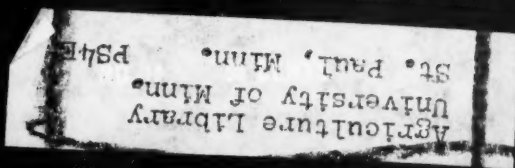
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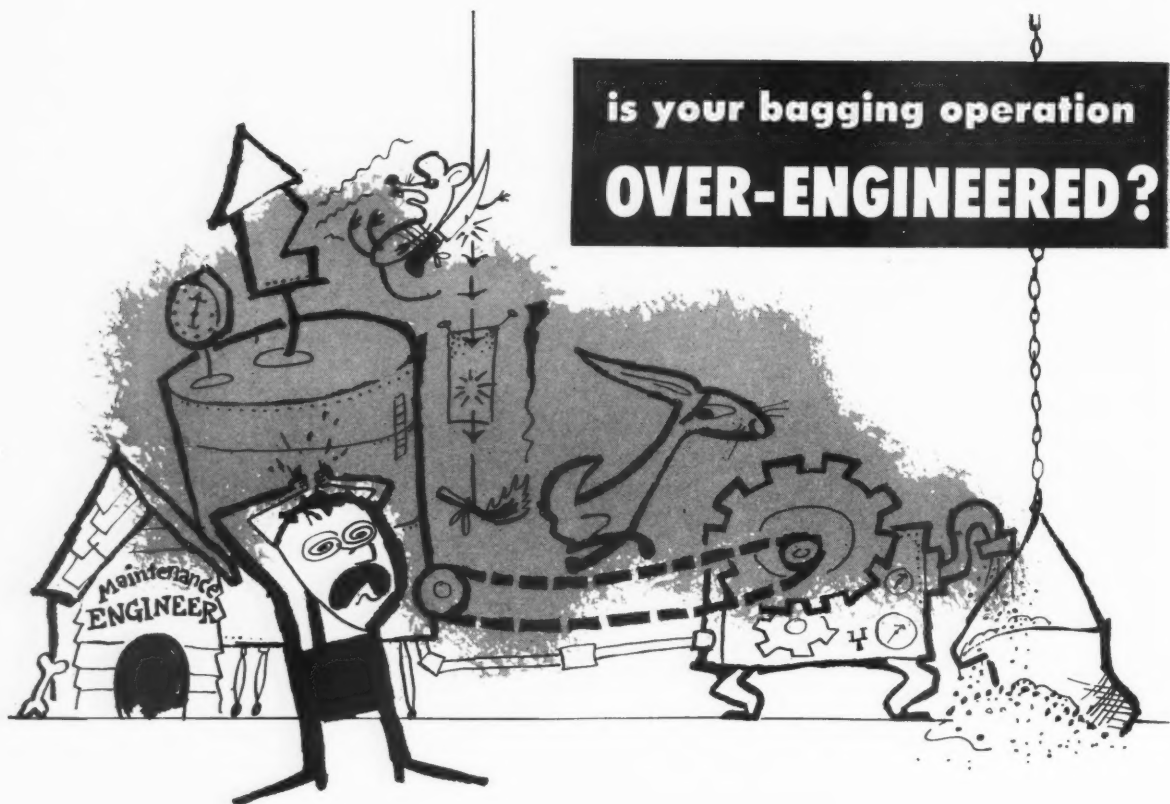
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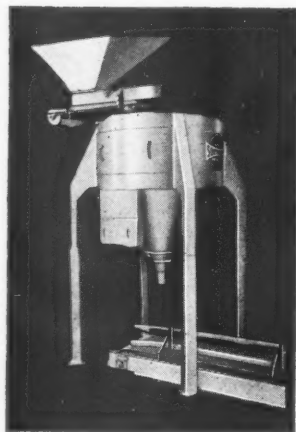




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Union's new "200" series I & C Baggers for feed and fertilizer packaging can do practically everything but tell time. But they can *save* you time. And plant space. And labor costs.

Each of the new models is completely automatic. Here are some of the advanced design features and operational advantages they offer you.

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These new machines net-weight 10 lb. through 50 lb. bags of granular fertilizer material and 10 lb. through 25 lb. granular feed material. As gross-weighting machines, they handle 80 lb. through 200 lb. granular fertilizer material and 25 lb. through 100 lb. feed material.

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**Space savers.** Union's new I & C Baggers are excellent space-problem solvers. Models UB-201 and UB-200 require only 3½' x 5' of floor space and only 7' above the sewing head conveyor. They also are equipped with wheels whether mounted on a conveyor or mounting frame. They can be moved easily for perfect alignment with other equipment or to meet changing plant conditions.

**Consistently accurate.** Whether you use them to net-weight or gross-weight, the new I & C Baggers maintain the same weighing accuracy that has made the "100" series famous throughout the feed and fertilizer industries.

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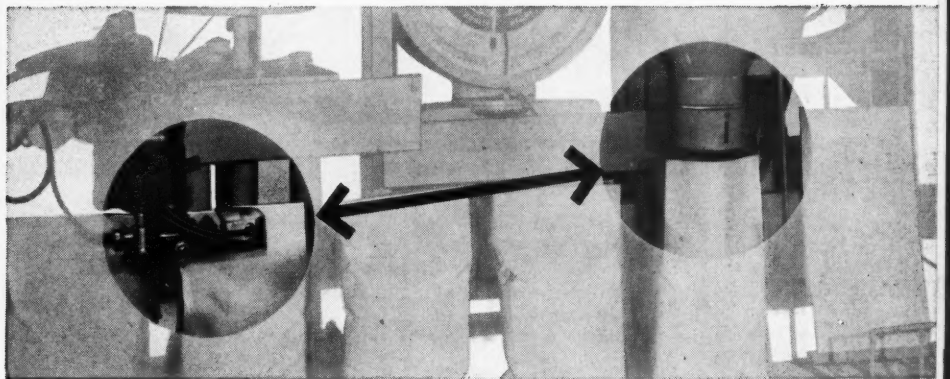
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MODEL UB-200  
(Beam Scale)



Two mounting positions for sewing head allow for multiple-man operation (above) or one-man operation (below).

**Complete Installation service.** Installation of the new I & C Baggers is fast and simple. The machine is delivered factory assembled and can be installed within 2½ hours. Union's installation engineers—located within easy reach of your plant—do the complete job including an engineering layout and instruction of your operating personnel—at a surprisingly low cost.

Write for full details about Union's new line of I & C Baggers for feed and fertilizer packaging.

**Union's well-known "100" series I & C Bagger.** If you require net-weighting up to 200 pounds, I & C Baggers—Series "100"—are recommended. We'll be glad to survey your packaging operation, help you determine which model best fits your needs.

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## IN THIS ISSUE

► Effective application equipment helps build strong markets for farm chemicals. For a report on a machine that is being perfected for applying insecticides, defoliants and liquid fertilizers to cotton, **see page 12.**

► John Harms writes that the significance of the new law for cotton, corn and rice is in the pattern it sets for the future. The theory is that more freedom for farmers—and the resulting surpluses—will cause forces of the market to end overproduction and eventually give equitable farm prices. Here's what the adjustment can mean to your farm chemicals market. **See page 18.**

## IN THE NEXT ISSUE

Your November FARM CHEMICALS, to be distributed at the Savannah meeting, will feature the 25th anniversary of the National Agricultural Chemicals Association. There will be articles by a plant pathologist, an entomologist, wildlife specialists and industry representatives. We'll tell, in pictures and words, the growth story of one charter member—and there will be reports on the other 13. We'll take a look at pesticide production for selected years, potential and actual insect and disease damage to agriculture, and other developments to help show the vital role of the NAC and the pesticide industry in our economy.

## COVER PICTURE

Christopher Guy Littleton, laboratory assistant with the South Carolina Department of Fertilizer Inspection and Analysis at Clemson, checks the label on a fertilizer sample before running tests on it. Multiply the hundreds of bottles on those shelves by all the states for an idea of only part of the work that will be represented when the Association of American Fertilizer Control Officials meets this month in Washington, D.C. (**See page 37.**)

# HOW TO GET THE MOST FOR YOUR FERTILIZER MACHINERY DOLLAR

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### Q - How much experience is built into the design?

**A -** You get the benefit of 84 years of practical fertilizer industry experience in each Sturtevant machine you buy. Unrivalled for fertilizer plant engineering know-how, Sturtevant originated the 'Unit' idea. Whether your need is for a replacement pulverizer or mixer, or a completely modern granulating unit, Sturtevant-engineered machinery always can be depended upon to fit your requirements like a glove.

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chinery. Many Sturtevant machines have been operating at top capacity and efficiency for well over a quarter of a century.

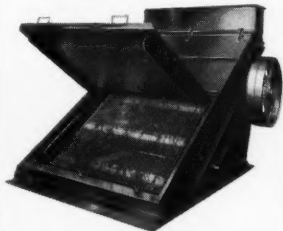
### Q - How accessible is the machinery for clean-outs and repairs?

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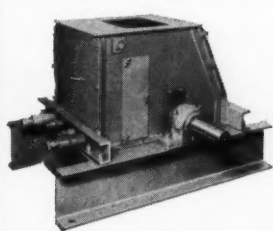
*For rugged, reliable, efficient machinery you can depend upon for years — or for engineering assistance in planning or upgrading your fertilizer unit — it will pay you to consult Sturtevant. Write to STURTEVANT MILL COMPANY, 140 Clayton St., Boston 22, Mass.*



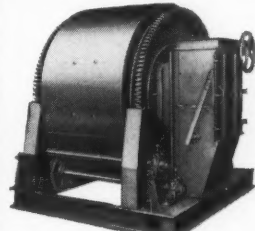
ELEVATOR



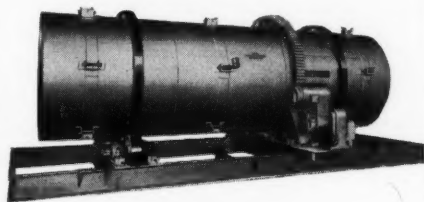
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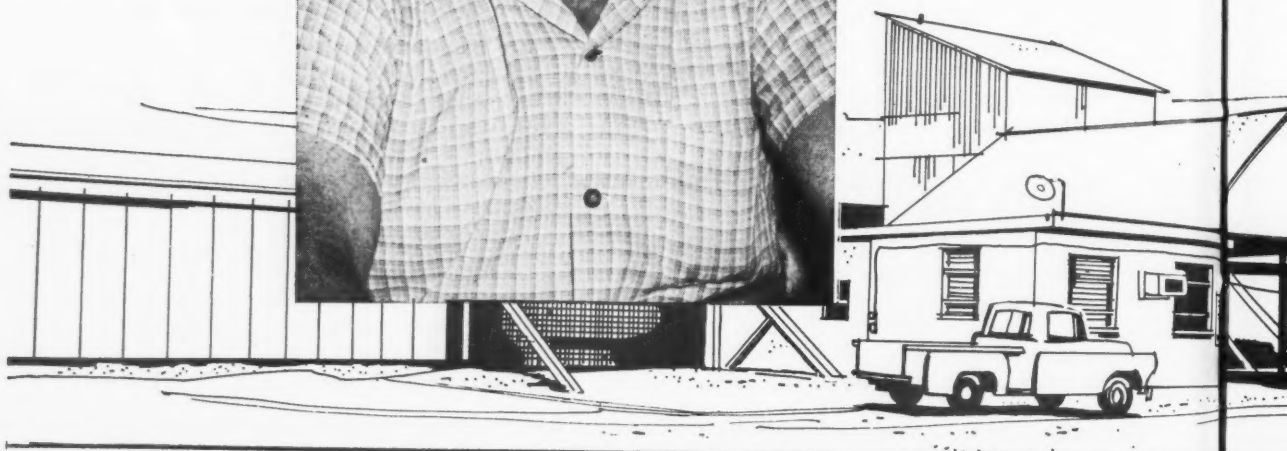
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E. W. Liggett, General Manager, Bartlett and O'Bryan. Around Owensboro, 4-16-16 is the most popular of the 8 grades mixed at this plant.

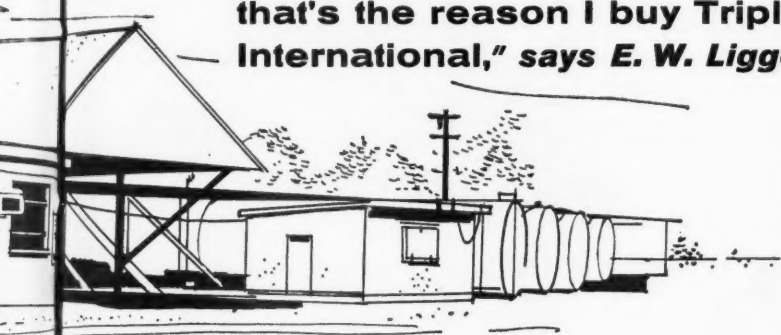




**In a 50 mile market around Owensboro . . .**

# **International's product and service help keep a growing customer list sold on Bartlett and O'Bryan Fertilizer Co.**

**"Good product...good service...good people — that's the reason I buy Triple Super from International," says E. W. Liggett, General Manager**



"I believe in giving my customers top notch quality and good service, and naturally I expect the same from the people I buy from." The speaker, E. W. Liggett, who has been an International Triple Super customer for the last six years.

He continues, "We have been using International Triple Super Phosphates ever since we started in business. It ammoniates well, handles good and enables us to put out a high quality product. This plus excellent transportation service and technical help supplied by International makes me a very well satisfied customer."

Liggett believes in keeping customers talking and buying Bartlett and O'Bryan fertilizers. Among his customer-service favorites is an annual Bar-B-Q, attended last year by over 900 guests.

Bartlett and O'Bryan formulates 12,000 to 15,000 tons of dry-mixed, ammoniated-type fertilizer per year . . . in 8 different grades, principally for corn, soy beans and tobacco. They use coarse and run-of-pile IMC triples.

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# VIEWING WASHINGTON

with Farm Chemicals  
Washington Bureau

on agriculture

Political winds and the election arithmetic point to continued control of Congress by the Democrats—but rising economic activity nationally may take some of the bloom off their rosy predictions. In the past two elections, Democrats have gained seats while Republican strength dwindled. Furthermore, a general rule is that the party in power at the White House loses congressional seats in off-year elections when there is no presidential race. Also, the near grand-slam in Maine in September is viewed as further evidence of the Democratic trend.

On the arithmetic, Democrats have 13 Senators up for re-election, and 6 of these are in the "solid" South and considered uncontestable for Republicans. On the other hand, Republicans have 21 Senate seats up for grabs. In the House, Republicans must hold onto their present 197 seats—and pick up 22 in order to get control. Democrats, however, can afford to lose 13 and still retain control.

With Democrats likely to control Congress the next two years, what is the legislative outlook? Basically, it may mean little change for industry. Major legislation, such as tax cuts on corporate profits, putting TVA on a competitive basis, further easing of excises, etc. are not to be expected. Emphasis will be heavier on so-called social legislation—looking toward the 1960 presidential election.

"Miller bill" fee increase announced by Food & Drug Administration for pesticide tolerance applications, however, will come under fire in the new Congress—and may be revised downward. But don't count on it.

National Agricultural Chemicals Association is opposed to the new boost, and plans to push for congressional action to kill it. It is seeking support for a bill introduced in the last session by Rep. A. L. "Doc" Miller, father of the pesticide tolerance bill bearing his name, to void FDA's fee boost. Miller's office indicates he will reintroduce the bill in the new Congress this winter. Miller's bill to abolish tolerance fees is based on the fact that FDA makes no charge for similar services—such as new drug applications and chemical additives testing. Meanwhile, FDA is sticking to its guns. Its information office says it's "heard no complaints" about the boost. FDA says further that it was losing money on former fee levels, and the increases are in line with the policy to put government services on a self-paying basis.

The "new look" in farm policy—use of surpluses to control future build-ups of other surpluses—was affirmed recently by White House adviser Clarence Francis. In a report to Congress, Francis said: " . . . probability is that our surpluses will continue to be substantially above any normal

# VIEWING WASHINGTON

## agriculture continued

or desirable carryover for at least the next 5 years . . . In the past 4 years . . . we have tended to look on the problem of our surpluses as a temporary one and thus make decisions concerning them on a year-to-year basis." This means: the Administration will keep price supports at the lowest level permitted by law. It means lower support levels all across the board. (See page 18)

USDA's little-known plant-disease forecasting service may be greatly expanded in the next year or so. At present, the service predicts the occurrence of late blight of potato and tomato, blue mold of tobacco, downy mildew of lima bean, and downy mildew of cucurbit crops. Also, plant pathologists regularly forecast 3 other diseases: apple scab, bacterial wilt of corn, and wheat leaf rust. Coming up: Forecasts of major diseases of cereal grains.

"With accurate forecasting," according to Dr. Paul R. Miller, head of the forecasting service, "growers can be notified several weeks and sometimes months in advance . . . giving them a chance to apply control measures in time to prevent losses."

Food preservative bill, sponsored by Rep. Bell of Mississippi, passed the House, but failed to clear the Senate in the last days of Congress. It is expected to be reintroduced next year. The bill would redefine the term "chemical preservative" so as to exempt fresh fruits and vegetables bearing harmless pesticide residues from unnecessary labeling requirements of the Food & Drug Administration. As passed by the House, the bill provided that labeling requirements of FDA shall not apply to raw agricultural commodities containing a fungicide or fungistat applied after harvest, received in a shipping container bearing a label stating the name and purpose of the chemical when they are displayed out of the container in accordance with trade custom.

Program to study effect of mass insecticide spraying operations on wildlife authorized specifically this year by Congress with passage of the Magnuson Bill, is expected to mushroom in the next few months. It's already started in southern areas infested by fire ant--on heptachlor and dieldrin. The Interior Department was given \$125,000 for the current fiscal year to make a broad study--with more money promised if needed. Interior will use \$80,000 on bird and mammal research; \$45,000 on fish. Agriculture and Interior Department experts will cooperate on an informal basis, with various universities also enlisted. Plans call for a major study in western states to determine the effect on wildlife of aldrin, dieldrin, etc. when used in the annual anti-grasshopper spray operations. Other areas of study include spraying against gypsy moth in the East, dutch elm disease in the Midwest, and spruce budworm in the West.





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equipment helps build  
strong markets for farm  
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for use by more and more  
cotton farmers is the**

# **High Clearance Sprayer**

*Excerpts from a paper presented at the 12th Annual Cotton Mechanization Conference, Brownsville, Texas, August 13, 1958 by E. Buford Williamson, a USDA agricultural engineer at the Delta Branch of the Mississippi Agricultural Experiment Station.*

**S**ELF-PROPELLED high clearance applicators are now standard equipment on many cotton farms in the alluvial and irrigated regions of the Cotton Belt.

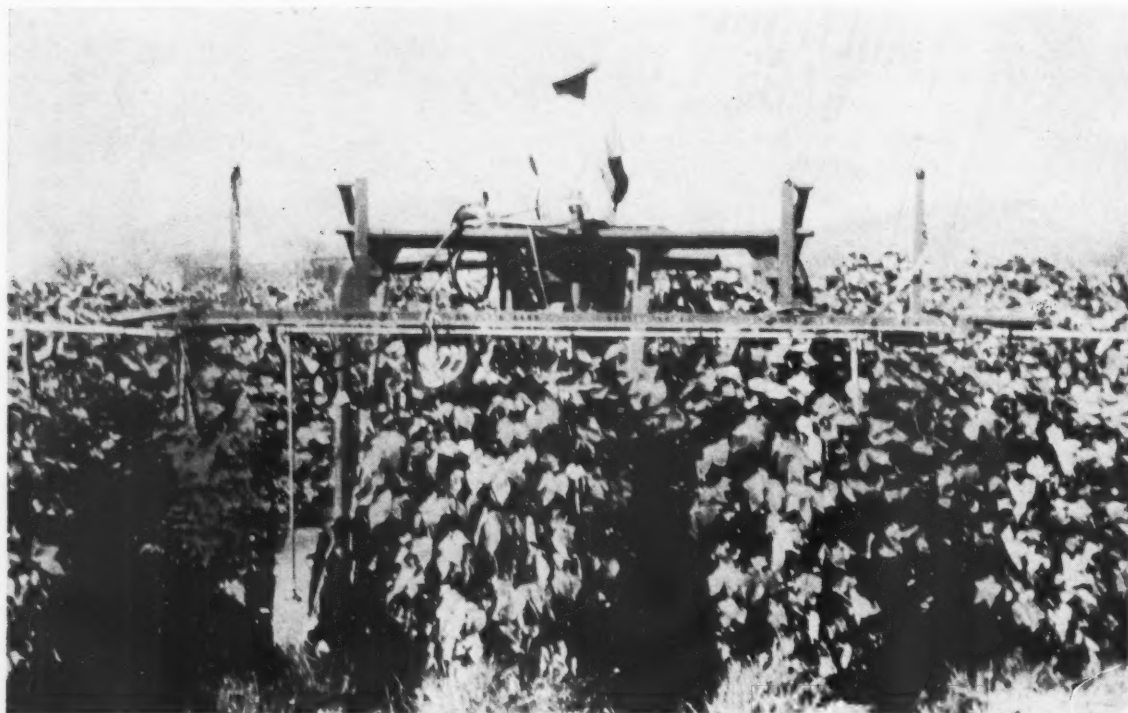
Widespread interest in this new type chemical applicator is a result of its overall superior performance and wide versatility—compared with other ground and air machines.

Besides serving in both early- and late-season insect control operations, it has proved capable of performing many other jobs. These include the application of liquid fertilizers, pre- and post-emergence chemicals and defoliants.

Several makers are also offering as optional equipment various cutting and seeding attachments in addition to spray, dust and granular applying equipment of all kinds. Mechanization research engineers have developed practical methods of installing and operating flame, mechanical and late-season chemical cultivating equipment on high-clearance vehicles.

## **Popularity Jumped in 1955**

These machines first appeared in the Cotton Belt about 10 years ago, but they did not gain prominence until 1955, a year in which late-season rains caused



**HIGH CLEARANCE** self propelled rig with low nozzle stance spraying defoliant when cotton bolls mature and don't need low leaves. Economy and accurate placement are among advantages. USDA Photo.

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an improved bag design—and \$4.05 per M savings! Another recommendation: convert all the firm's

present Sewn Valve Multiwalls to Sewn Open Mouth types. This complete changeover will further streamline bagging and, based on the company's annual requirements, result in thousands of dollars in additional savings.

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rank growths of cotton and severe insect problems. By the end of 1957, over 2000 had been operated by farmers in the lower Mississippi Valley and several hundred more were reported in use in California, Texas, other irrigated and bottom-land areas, and coastal plains of the southeast. Most of the rigs were equipped with 8-row sprayers and were used primarily for the application of liquid insecticides.

Several factors influenced the development of this new agricultural tool and its eager acceptance by cotton farmers. *Foremost was the development of synthetic organic insecticides shortly after World War II, which made possible the spraying method of applying insecticides.* Previously, most insecticides had been applied as a dust, and insect control often suffered because dusting was usually an off-hour, disagreeable task to the farmer.

### Sprayer on Cultivator Not Answer

Introduction of the synthetic organic compounds was accompanied by the development of the low-gallonage, low-pressure sprayer. Some research workers first used this inexpensive applicator with the cultivator so that early spraying for thrips and other cotton insects could be accomplished simultaneously with regular cultivation. As a result, many farmers became interested in a chemical-control insect program for the first time and several thousand of these machines were sold in the Mississippi Valley alone in 1950 and 1951.

However, the practice of combining these two important operations did not prove entirely satisfactory. It soon became evident that the interval of spraying for insect control was often different from that required for cultivation, and that only limited acreage could be covered with a 4-row sprayer traveling at normal cultivating speed. *In recent years, late infestation of cotton plants by various insects has also pointed more and more to the need for a sprayer that can be used in cotton of any height.*

Early attempts at mounting chemical application equipment on a high-clearance vehicle consisted of installing a sprayer or duster on the chassis of a cotton picker tractor. This was done by removing

the picking unit and basket from the tractor and mounting the applicator rig on the stripped-down machine. The practice did not prove too satisfactory, however, since many farmers preferred to convert their cotton picker tractors to standard tractors for other crop production jobs. In addition, all makes of cotton pickers were not capable of being modified to chemical applicators.

*Although experimental attachments have been devised for applying chemicals for late-season weed control and for defoliant, additional research is needed to perfect application equipment of this kind.*

### Economy of Operation

One of the most outstanding qualities of the high-clearance applicator is its low cost of operation. Results of a survey of high-clearance machine operators in April 1956 by James H. White of the Arkansas Department of Rural Economics indicated the cost of application with the ground machines was much less than with airplanes when a total of 1000 acres or more acreage was covered per year. The study, which did not include the cost of the spray or dust, showed that the cost of application was less than one-half that for airplanes when the total acreage involved was more than 3000 acres.

Insecticide manufacturers have found in tests that farmers can maintain a 3-day schedule with ground machines at the same cost as that required for maintaining a 5-day schedule with airplanes. This includes the cost of materials which are currently available. Even greater savings can be expected when farmers fully utilize their machines for the many different operations they will now do.

Other important advantages of the self-propelled, high-clearance applicator over airplanes include:

- Better control of the quantity of chemical applied
- Placement of the chemicals exactly where they are needed
- Covering parts of fields that are inaccessible to airplanes
- Effect on aerial applicators, who are now compelled to do a better job.

*The primary disadvantage of the high-clearance ground applicator is the problem of operating in wet fields. This is caused by excessive rainfall in some areas and by irrigation in others. Due to the light weight of this applicator, presently available row-crop tires at minimum pressures do not provide adequate flotation. Investigations were recently initiated by public research engineers in cooperation with tire and machinery companies for the purpose of studying this problem. Controlled laboratory and field tests on tire flotation and mud shedding qualities have been designed to provide basic information that can be used in improving the performance of self-propelled, high-clearance machines.*

*The following areas appear to need additional attention:*

1. Adequate power units on all models (minimum of about 25 horsepower).
2. Lower center of gravity for improved stability on tricycle models.
3. Increased use, if possible, of the 2-drive-wheel principle.
4. Less weight and increased strength in chassis.
5. Floating type wheel shields.
6. Easier operation of vehicle and applicator.
7. Speedometer.
8. Corrosive-resistant plumbing fixtures and tanks.
9. Safer loading and operating facilities. ▲





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# PLANT FOOD RESEARCH

- *Interaction among trace elements*
- *Hydrophos process for calcium metaphosphate hydrolysis*
- *Countercurrent vs. cocurrent drying*
- *Urea and ammonium nitrate as supplemental N in complete liquids*

## **Interference Between Nutrient Elements in Plant Growth**

IRON, which plays an important role in the formulation of chlorophyll, may be very readily oxidized by manganese. As a result of this oxidation, inactivation of iron takes place. To protect iron against further oxidation to the trivalent state, a high ratio between iron and manganese is essential.

The interference between iron and manganese commonly results in iron deficiency and severe manganese toxicity. The manganese toxicity in this case is a result not of a high initial concentration of manganese, but of the reduced ratio between iron and manganese.

Iron, manganese and copper represent a physiological unit and while manganese has antagonistic action, copper has synergistic action in the utilization of iron in chlorophyll synthesis. However, the real benefit of copper can be secured when it is used for foliar treatment.

Among other trace elements, magnesium should also be utilized to improve the performance of phosphate ion. Magnesium functions as a carrier of phosphorus, and also helps to reduce the precipitating action of phosphate ion on trace elements.

The anions of trace elements such as borate and molybdate have very powerful precipitating action on trace element cations due to their high alkalinity.

Zinc is essential for seed production in certain legumes and absorption of zinc is often reduced because of copper deficiency. Zinc is most important for fruit and nut trees because of its function in seed production.

A. A. NIKITIN  
Research Laboratories, Tennessee Corp.

## **Commercial Aspects of Calcium Metaphosphate Hydrolysis**

FERTILIZER grade calcium metaphosphate contains about 64 per cent  $P_2O_5$  and thus is an economic carrier of phosphorus. Preliminary work by James E. Seymour, at the Illinois Farm Supply Co., indicated that rapid hydrolysis and ammoniation of

calcium metaphosphate could be attained by conducting the hydrolysis in the presence of a strong acid or base. This work led to the construction of a plant at East St. Louis, Ill., using a new process (Patent 2, 837, 418). This process tolerates a high degree of fluidity using a series of pug mills for hydrolyzing, ammoniating and granulating the calcium metaphosphate mixture. Further investigations of the chemistry involved in this process showed that various degrees of temperature and acid concentrations of the initial reactants produced decidedly different end products, varying from complete hydrolysis to orthophosphate through pyrophosphates and chains of polyphosphates. The subsequent ammoniation rate of these products was also affected by the initial conditions. The use of sulfuric acid involved a high enthalpy change. Phosphoric and superphosphoric acids produced lesser changes, while nitric acid produced little or no change.

At present the new hydrophos process is competitive with other existing processes, but continuing improvement in hydrolysis and ammoniation rates will produce a more economic, superior material.

J. L. JENISTA, A. V. MALONE AND L. J. PIRCON  
Central Farmers Fertilizer Co.

## **High-Analysis Superphosphate by the Reaction of Phosphate Rock with Superphosphoric Acid**

THE PRODUCTION of high-analysis superphosphate (54 to 56 per cent  $P_2O_5$ ) by reaction of phosphate rock with superphosphoric acid was studied in bench-scale, pilot-plant and plant-scale equipment. The best results were obtained when the acid concentration was about 74 per cent  $P_2O_5$  and when the acid was preheated in the range of 180° to 225° F. When the superphosphate was held in a den or storage pile, its temperature reached a maximum of 300° to 350° F. in about 40 minutes. This high temperature promoted fluorine volatilization and rapid conversion of the  $P_2O_5$  to an available form.

The superphosphate usually contained 1 per cent or less of free moisture, and the  $P_2O_5$  was chiefly in the form of anhydrous monocalcium phosphate. About 65 per cent of the fluorine was evolved as compared with about 15 per cent in the production of conventional triple superphosphate. The com-

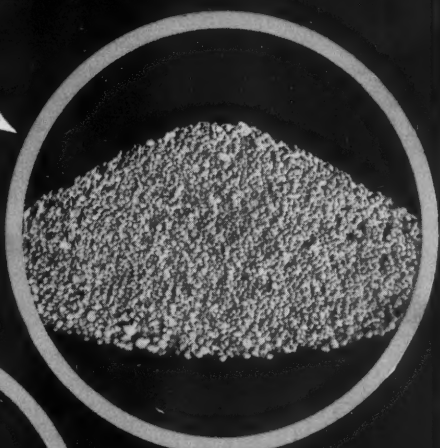
(continued on page 22)

# TRIPLE SUPERPHOSPHATE



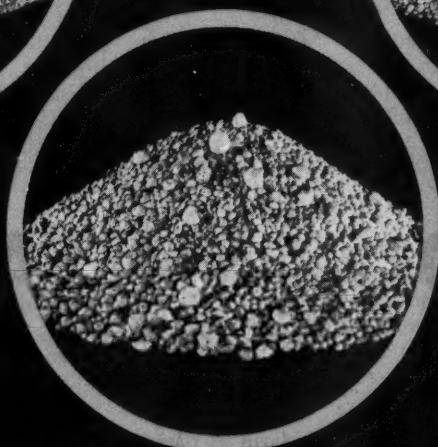
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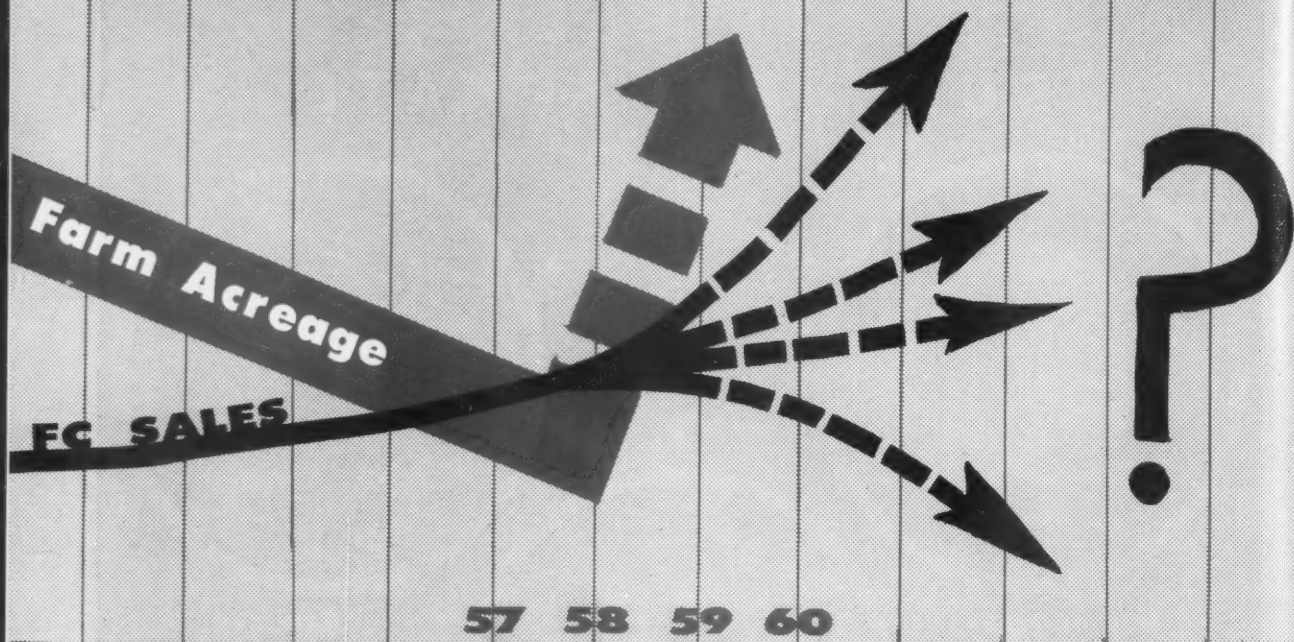
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# NEW LOOK IN FARM LAW

Can more freedom to plant eventually stop overproduction?

BY JOHN HARMS

**F**EDERAL FARM POLICY—a big factor in farm chemicals sales in recent years—is undergoing a radical shift in direction as the result of new legislation signed into law by President Eisenhower in September.

After a quarter of a century of attempting to maintain farm prices (and income) at high levels through artificial production restrictions, the federal government finally is turning to a limited form of free enterprise to reach that objective. While the new Agricultural Act of 1958 is extremely restricted in scope—affecting immediately only three major crops—its real significance lies in the pattern it sets for farm policy legislation in the years ahead.

In effect, the new farm law says that it is the intent of Congress that all production controls be removed from farm crops as rapidly as possible, and that the government's only obligation to farmers is to provide price supports at low, disaster-prevention levels. Congress, thus, apparently has bought the philosophy of Agriculture Secretary Ezra Taft Benson.

The limited progress made in the direction of free enterprise, as represented by the new law, is expected to form the basis for greater strides in that direction during the 86th Congress this winter. *While there always is the possibility that Congress may reverse itself—or refuse to go further toward free enterprise in farming—it is considered highly unlikely by Washington observers.* The general rule is that once Congress

passes a major law, it tends to expand on the intent represented by that law in future legislative actions.

## What The New Law Does

Generally, the 1958 farm act permits the Secretary of Agriculture to reduce price support levels of corn, cotton and rice to a new floor of 65 per cent of parity, under various specific circumstances and events. This authorization breaks through the previous minimum support level of 75 per cent of parity. Minimum permissible supports of 65 per cent of parity comes close to the level at which economists say farm commodities will clear the open market. It also comes close to Benson's request for a 60 per cent of parity support floor.

At the same time, the law sets up conditions under which planted acreages of these crops can be greatly increased and acre allotment restrictions either removed entirely or greatly relaxed. This, too, is in line with Benson's program to "give the farmer more freedom from government intervention."

*Here, specifically, is what the new farm law does on the 3 so-called basic crops affected:*

► On cotton, producers can elect their individual choice of either (1) adherence to acre allotments as proclaimed by the Agriculture Department in exchange for price support at about 80 per cent of parity, or (2) increase plantings up to 40 per cent above the allotment and receive price support at 15



per cent below those who keep within allotments, or roughly 65 per cent of parity. Over-all price support level reduces 5 per cent each succeeding year until the minimum 65 per cent is reached in 1962.

► On corn, growers will vote in a December referendum as to whether they prefer to have no acreage allotments in 1958 with price support at 65 per cent of parity. If a simple majority *does not* favor the new program, the present set-up will be continued; that is, price support at about 75 per cent of parity plus acre allotments at about 35 million acres.

► On rice, the 1.6 million acre allotment becomes a permanent floor, and supports could be reduced to 70 per cent in 1961 and 65 per cent of parity in 1962.

► On the other three basic commodities not directly affected by the legislation—wheat, peanuts and tobacco—current programs will continue as-is for 1959. That means a 55-million-acre allotment for wheat, slight acre allotment changes for tobacco and peanuts, and no change in price support levels. But Secretary Benson has indicated he will seek to get the law changed on these to conform with the principle of greater planting freedom and lower price supports now the law of the land for the producers of corn, cotton and rice. His chances of success are rated better than 50-50, but these changes would in no event take effect until 1960.

#### Next Year, Many More Acres Planted

There is little doubt in official circles here that the changes in law applying to cotton and corn will bring on a tremendous increase in planted acreages next year. Furthermore, when, as and if, wheat, tobacco and peanut acre allotments are relaxed—expert

opinion is that planted acreages of these will also increase during at least the first two years of relaxed controls.

The land planted to cotton and corn next year unofficially is expected to increase by *as much as 15 million acres* as a result of the new law. Here's how:

*Cotton plantings* are expected to hit close to 20 million acres in 1959—a 4 million-acre boost over the current allotment, and almost 8 million acres more than the 12 million planted this year. This will result from the new authority to increase plantings 40 per cent above the current allotment, and a large number of growers are expected to go all-out. Large increases are expected in the Western States, parts of the Southeast, the Delta area, and in parts of Texas.

*Corn plantings* are expected to increase 7 million acres or more above this year's actual 74 million acres. This is predicated on the widely-held belief that producers will vote in favor of the new program in the December referendum. Furthermore, the estimate is believed to be conservative.

Most of the acreage destined to go into cotton and corn next year will come from land contributed to the Soil Bank's Acreage Reserve for 1958. The Acreage Reserve is terminated at the end of this year and will release 17.2 million acres of formerly-tilled land back into production. (See August issue, FARM CHEMICALS)

#### The Open Market Versus Surpluses

It is highly significant that the shift toward increasing "freedom from government control" comes at the present time. Congress has decided to go the route of free enterprise in agriculture at a time when

ADJUSTMENT: More acres and surpluses. Also expanded farm chemicals markets?



agriculture is plagued by unprecedented surpluses—surpluses that will be swelled to even greater proportions from record harvests being produced this year.

The significance lies in the obvious federal intent to let surplus production, rather than federally-imposed restrictions, force supply in line with demand. *The developing theory at the USDA is that, without government restraints, increasing production will drive largely-unprotected farm prices down, and force a cut-back in production in the years ahead.*

The USDA's economic theorists believe that the sooner the *actual forces of the market place* can be brought directly to bear on surplus production, the sooner farmers will be forced out of producing surpluses and into other crops—thus bringing about a balance between supply and demand.

In essence, it is the actual beginning of a new concept of crop control. While government emergency production control programs, such as direct quotas on bushels and pounds, are being studied—just in case they're needed somehow—this is the new concept of crop control apparently being developed at the Department of Agriculture.

When acre allotments of the basic commodities have been removed or greatly increased—according to official request, and price supports reduced to "disaster levels," there will come a rapid de-emphasis in the long-time incentive to produce ever more on each acre. Farmers will be making production plans not on the price support level—aimed at federal warehouses—but on the vagaries of the market.

During the program's first year or so, experts predict that production will go higher than now—as farmers try to make up in volume for what they lose in price. But the increased surpluses will have a greater impact on market prices—because less will be taken by the government—and price will go down sharply. With very low prices, many farmers will cut back heavily on production of surplus crops, and shift to other crops.

Eventually, according to the program, the weight of surpluses on the market will force production into line with demand—and market prices once again will be on the up-swing. *Thus, the surplus problem will have been solved almost entirely by the surpluses themselves. And the free enterprise system once again will have been restored in agriculture, say proponents.*

**TOBACCO** might follow the policy path to less planting control and lower price props, but not before 1960. USDA Photo



**WHEAT** plantings could take a big jump if future allotment and support policy is altered to fit the new pattern. USDA Photo

### Next Year, Greater Sales Potential

Consensus of opinion of experts in the field is generally that the increased acreages in sight for 1959 for both corn and cotton, and to a limited extent, rice, will stimulate sales for both fertilizer and pesticides. The extent to which the fertilizer market will be influenced of course depends upon the extent to which farmers apply plant foods on the increased acreage. The potential for increased fertilizer sales certainly is there, our experts say, with about 15 million additional acres expected to be put in cotton and corn next year.

Generally, during the first years of adjustment to the new "program"—that is, toward fewer controls and lower supports—the anticipated increases in acreage will offer a wider base for plant food sales. But in the years following the initial adjustment, after the play of the open market begins to affect farm production, the character of fertilizer demand is expected to change. That is, farmers could be expected to shift out of surplus crops—such as the big fertilizer-consuming crops of corn and cotton—and into others. This would not mean that fertilizer sales would necessarily slump, because farmers staying in production of such crops likely would continue using increasing amounts of fertilizer—and those shifting to other crops probably would not cut down their use. In short, plantings of the major crops may vary a great deal more than during the past few years—and with these changes, the fertilizer market could expect to vary.

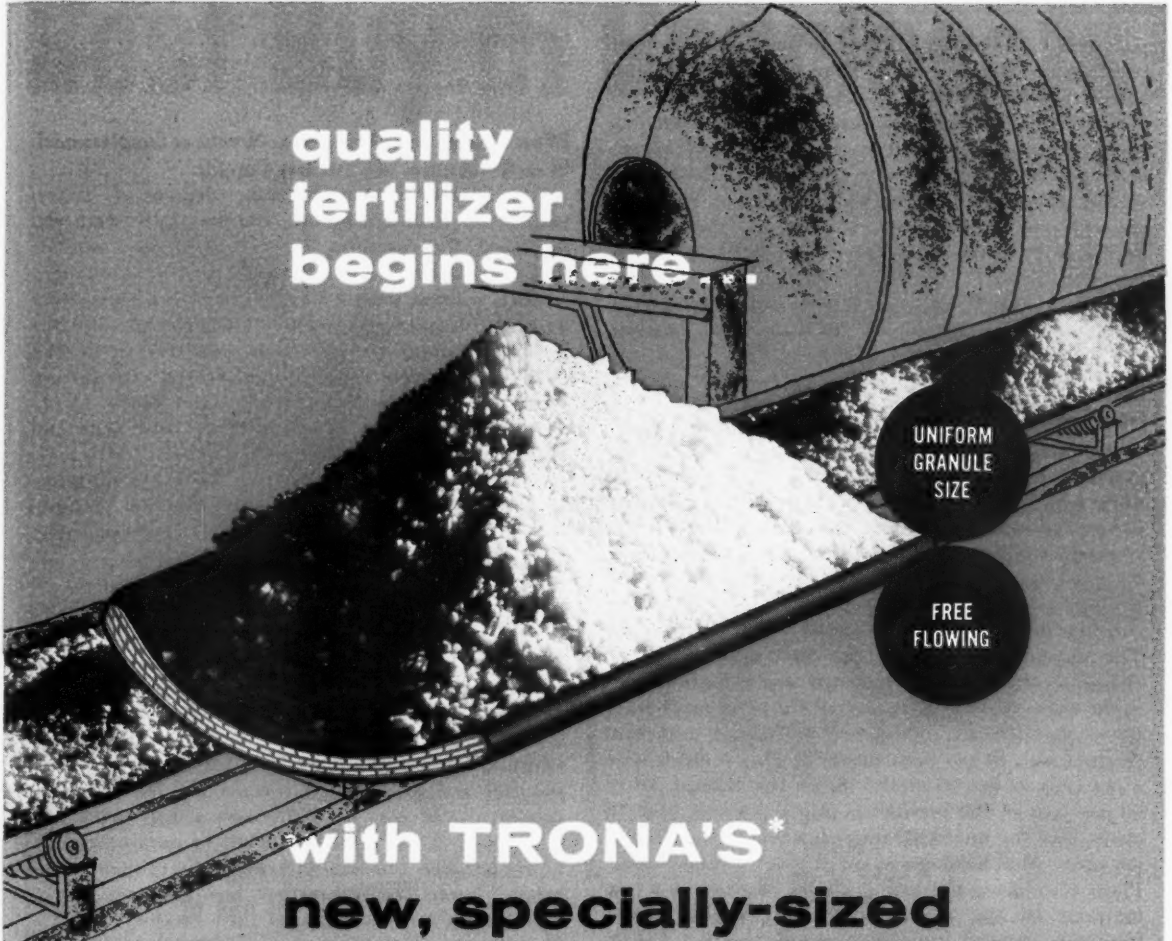
For pesticide sales, the larger crops in view during the next few years augur well—if only for the reason that increased acres mean more plants will need protection from insects, weeds and diseases. Also, the piling up of surpluses, likely to continue for several years, indicates that insecticides for storage of crops may be needed in larger quantities. The ups and downs in production likely to prevail after the new program takes hold also will affect pesticide sales as farmers shift emphasis from crop to crop.

► **Summing up:** The Agricultural Act of 1958 marks the dawn of a new era in agriculture. It promises to bring about vast changes in methods of controlling farm production. *Farm policy is moving in the direction of less government management of farm production, freer decisions for farmers. It means strong markets for farm chemicals in general, but with shifting emphasis from time to time.* It may also mean that the farm chemicals industry will find it increasingly necessary to keep in close touch with the farm economy. ▲









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## RESEARCH (Continued from page 16)

paratively anhydrous nature of the product and evolution of compounds of fluorine account for the substantially higher  $P_2O_5$  content.

Good ammoniating and processing characteristics have been demonstrated in pilot-plant and plant-scale production of granular fertilizers. Economies should be realized in handling and shipping the more concentrated superphosphate and in the higher grades of fertilizers that can be prepared with this material.

A. B. PHILLIPS, R. D. YOUNG, F. G. HEIL AND M. M. NORTON  
Tennessee Valley Authority

### Granulation of By-Product Phosphate From Sodium Phosphate Manufacture

IMPURITIES in wet-process phosphoric acid are precipitated during neutralization of the acid with soda ash. The precipitate is separated from the sodium phosphate solution by filtration and dried to produce a plant food containing about 40 per cent  $P_2O_5$ . Two dryers are used in the series. Chains are used in the first dryer to prevent build-up by the entering material, which contains 60 per cent water. The second dryer is of the roto-louvre type. A change in the control of moisture and retention time in the chain dryer greatly altered the physical character of the product. Prior to the change, a typical product was 50 per cent minus 2, plus 6 mesh, and 5 per cent minus 60 mesh. Since the change, 80 to 90 per cent of the product is minus 6 mesh, plus 20 mesh, and the minus 60 mesh fraction is less than 3 per cent. Also, hardness of the product was increased. Plant tests using the new granular product as a raw material in the manufacture of granular mixed fertilizers showed improved granulation for 1-4-X ratios similar to the experience previously reported with granular superphosphates and potash.

The granular product can be converted into a finely divided material by grinding. The powdered material is an excellent conditioning agent for both powdered and granular mixed fertilizers. The high  $P_2O_5$  content of proven agronomic value permits use for conditioning without downgrading in most cases.

L. B. HEIN AND A. LONG  
Olin Mathieson Chemical Corp.

### Countercurrent Versus Co-Current Drying Of Granulated Mixed Fertilizers

AN EXPERIMENTAL continuous mixed fertilizer granulation unit was operated with both countercurrent and co-current drying. Comparisons were made of fume formation, chemical composition of product and fuel consumption.

Countercurrent drying resulted in less fume formation in the dryer exhaust gases primarily because material adhering to the feed chute and flights, and the finer portion of the dryer feed material were not subjected to as high throat temperatures as with co-current drying. Substantially lower fuel consumption resulted from countercurrent drying. No important differences in chemical composition of product were noted. To achieve less fume formation

by countercurrent drying, proper design of the furnace and dryer is necessary.

N. K. ALFEY AND G. L. BRIDGER  
Grace Research & Development Div., W. R. Grace & Co.

### Effect of Urea and Ammonium Nitrate as Supplemental N on Solubilities of Complete Liquids

SATURATION TEMPERATURES, degree of supersaturation and salting-out temperatures were determined for common usable grades of complete liquid fertilizer. Grades studied varied in nitrogen to  $P_2O_5$  content from 1 to 3 (all of the nitrogen from neutralizing ammonia) to 4 to 1 where high amounts of supplemental nitrogen from urea and/or ammonium nitrate were required. Mixtures with saturation temperatures above 80° F. and below 0° F. were considered to be impractical and were not studied.

Fifty-five grades representing various concentrations of 20 fertilizer ratios were studied. Graphs showing information obtained on representative grades are presented.

From this information in so far as the effect on saturation temperature of complete liquid fertilizers is concerned, it can be concluded that (1) urea has a definite advantage over ammonium nitrate as supplemental nitrogen; (2) various combinations of urea and ammonium nitrate are to be preferred to straight urea for some grades; (3) the eutectic solubility effect of urea and ammonium nitrate is definitely reduced and also shifted toward the use of higher proportions of urea to ammonium nitrate when  $K_2O$  is supplied in the form of muriate of potash; and (4) liquid fertilizer manufacturers can, by proper formulation, lower the saturation temperatures and/or increase the concentration of their products.

H. H. TUCKER, G. G. CROSS, S. GARNT, JR. AND M. J. GR MAN  
Sohio Chemical Co.

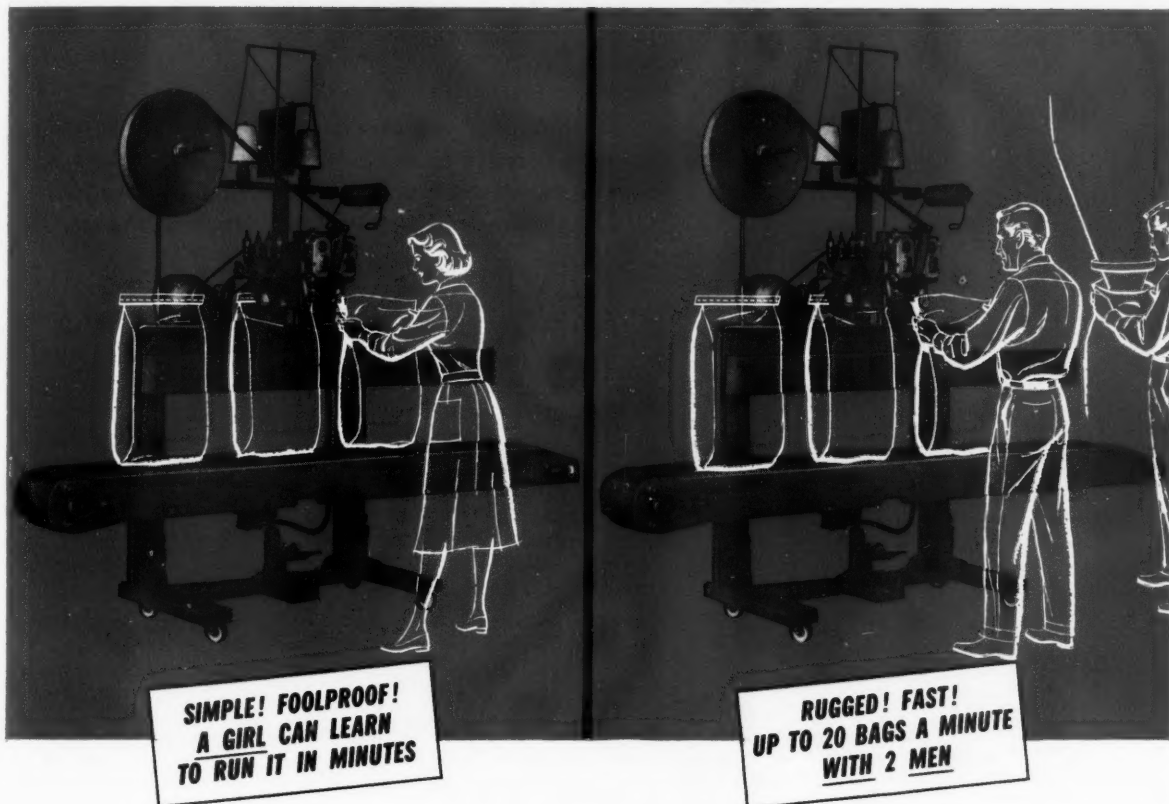
### Crop Response to Zinc Fertilization

*Presented before the Division of Soil Fertility, Fertilizers and Plant Nutrition of the American Society of Agronomy, August 7, 1958.*

GREENHOUSE experiments were conducted on Hartsells soil to study the influence of liming rate, phosphorus fertilization rate and the Ca/Mg ratio of the liming material on crop response to zinc fertilization. The influence of the various treatments on plant composition was also determined. The first experiment showed a progressive depression in yield as the lime rate increased when no zinc was applied, but no yield decrease when 20 pounds of zinc per acre was applied. Phosphorus fertilization up to 1,000 pounds of  $P_2O_5$  per acre increased crop yields. In a second experiment the Ca/Mg ratio of the liming material was varied. The highest yields were obtained at a 2:1 ratio. In both experiments zinc fertilization resulted in a decrease in the P, K and Mg content of the plant material. As the Ca/Mg ratio of the liming material became narrower the Mg content of the plant material increased and the Ca and K content decreased.

LOYD F. SEATZ, ATHAN J. STERGES  
AND JAMES C. KRAMER  
University of Tennessee

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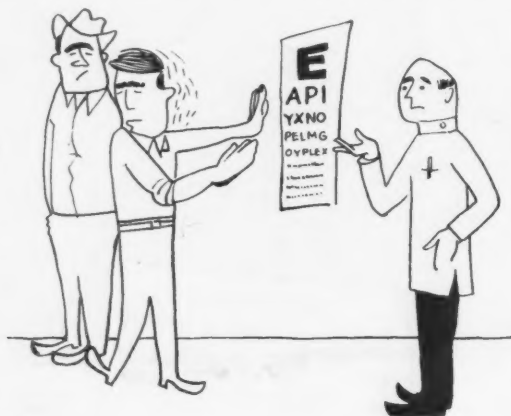


# How Would You Decide?

**F**  
**C**

*A monthly roundup of day-to-day employee problems and how they were handled by management. Each incident is taken from a true-life grievance which went to arbitration. Names of some of the principals involved have been changed.*

## If Employees Turn Out Poor Work, Can You Make Them Take Physical Exams?



### What Happened:

Management was very disturbed. A large number of their products were being returned by customers as defective. It seems the inspectors were letting too many bad parts go through for shipment. It required good eyesight to catch the flaws. Faced with the loss of business, the company ordered all inspectors to take eye examinations. All complied except two men. These two men were given a four-day layoff. They protested right up to arbitration, claiming:

1. We were not required to take eye examinations when we applied for a job, so you cannot make these requirements now.
2. You are creating a new condition of employment, and this cannot be done without negotiating a new clause with the union.

The company countered:

1. We have to protect our business. Eye examination is one way to find out what is causing the poor inspections.
2. No man's job is in jeopardy. If eye examinations call for glasses, we will pay for them. What could be fairer?

Was The Company:    **RIGHT** ☐    **WRONG** ☐

### What Arbitrator Whitley P. McCoy, chairman ruled:

"As to the right of the company to institute physical examinations, no one can doubt that right under certain circumstances. If a man is seen to stumble repeatedly, faint, nearly get killed, nearly cause the death or serious injury of a fellow employee, would anyone contend that the company was living up to its duty to protect the safety of that employee and his fellow employees if it failed to take necessary steps to ascertain his condition and see to its correction? As long as the company adopts reasonable measures, and applies them without discrimination in order to protect the health and safety of the employees, it exercises a proper function of management. If the company has the right, and even the duty to order reasonable physical examinations to protect health and safety, I think it equally has that right, where facts indicate a need for it, to insure production of a salable product."

## Are Senior Employees Entitled to Get First Crack at Available Overtime?

### What Happened:

Because of a downturn in business, overtime work was getting scarcer. Whenever such assignments came up, supervisor Masur would parcel out the extra time to employees he felt needed it most. For example, there was John Kline. His wife had recently given birth to twins, which put a heavy load on John's pocketbook. So the supervisor saw to it that John made a few extra dollars when overtime came up.

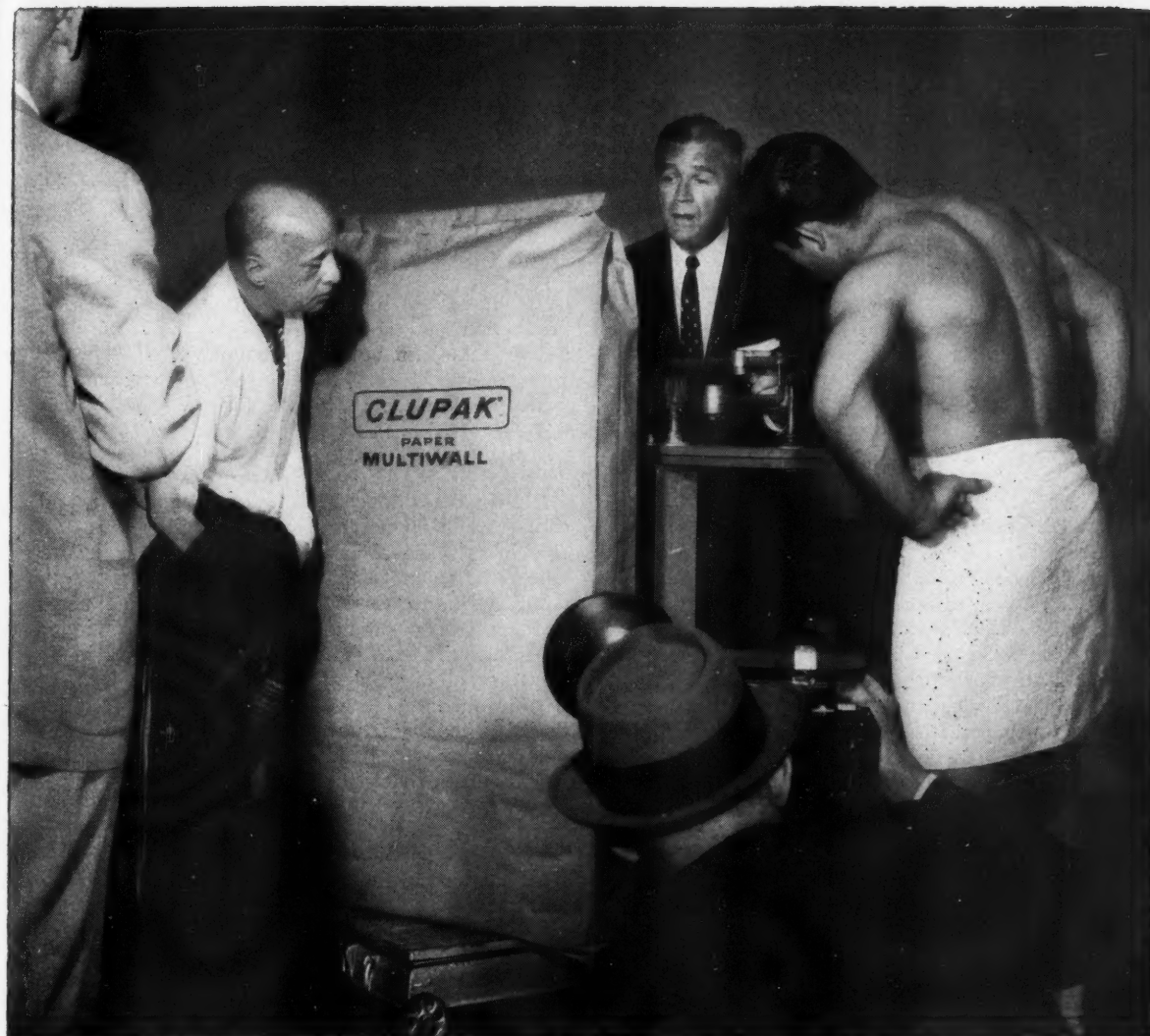
The union didn't like the way Masur was handling these assignments. "We have a seniority system here, and that means that the old timers must get first crack at overtime. Let Kline wait his turn."

"I know the contract inside-out," said Masur. "It doesn't say that overtime has to be parcelled out by seniority."

"It doesn't have to say it," maintained the union. "We have a general seniority clause and it applies to all situations. If you don't go along, we're going to take it up with management."

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OCTOBER, 1958

\*Clupak, Inc.'s trademark for stretchable paper.



## How Would You Decide?

**FC**

case went to arbitration. The union admitted that its seniority clause did not mention "overtime" but did include promotion and layoffs. However, the union argued that seniority is to protect a worker against discrimination. Assigning younger men to extra-hour work is just that.

The company saw it another way. Seniority is not an automatic right. It exists only in so far as specified in the union contract.

**Was The Company: RIGHT ☐ WRONG ☐**

**What Arbitrator Angus S. McSwain, Jr. ruled:**

"It is undisputed that the company has not followed seniority in assigning the work. It is elementary, however, that seniority and seniority rights exist only insofar as they are provided by contract. Even without a 'management prerogative' agreement management has the right to direct the working force and to assign work except as limited in the contract. The doctrine that seniority and seniority rights exist only by contract is a corollary of the inherent power of management. Grievance denied."

**To Stay Competitive, Can a Company Eliminate Certain Jobs?**



**What Happened:**

In the interest of better production, the company decided to cut out a group of jobs, and assign some of these duties to other employees. The union protested: "these jobs cannot be eliminated without negotiation—the contract doesn't give the company any such right—the agreement said nothing about job elimination and therefore the company cannot take this function on to itself."

Management stood its ground and maintained that

a company cannot be stagnant and remain in business. If certain jobs become unnecessary to good production, out they go. A company is in business not to make jobs, but to make money.

**Was The Company: RIGHT ☐ WRONG ☐**

**What Arbitrator Carl A. Warns, Jr., ruled:**

"It is well established in industrial relations, and confirmed in numerous published arbitration cases, that in the absence of a restriction in the collective agreement, management has the inherent right to eliminate jobs, classifications, and to combine duties in the interest of production. The only restriction is that the admitted right NOT be exercised in an arbitrary or discriminatory manner. Management has an inherent right to make all essential decisions designed to make the company competitive. The elimination of jobs and the combination of job duties is included in that right."

**Can an Employee Be Fired for Violating The "No Smoking" Rule the First Time?**

**What Happened:**

The company had very strict rules on smoking. Why not?— Its business was oil refining, and the biggest hazard was fire. To impress workers with the dangers of this hazard, it

1. issued a safety manual telling employees about the "no smoking" rule.
2. put notices on bulletin boards.
3. placed a map of the plant at all employee entrances indicating "safe-smoking areas."

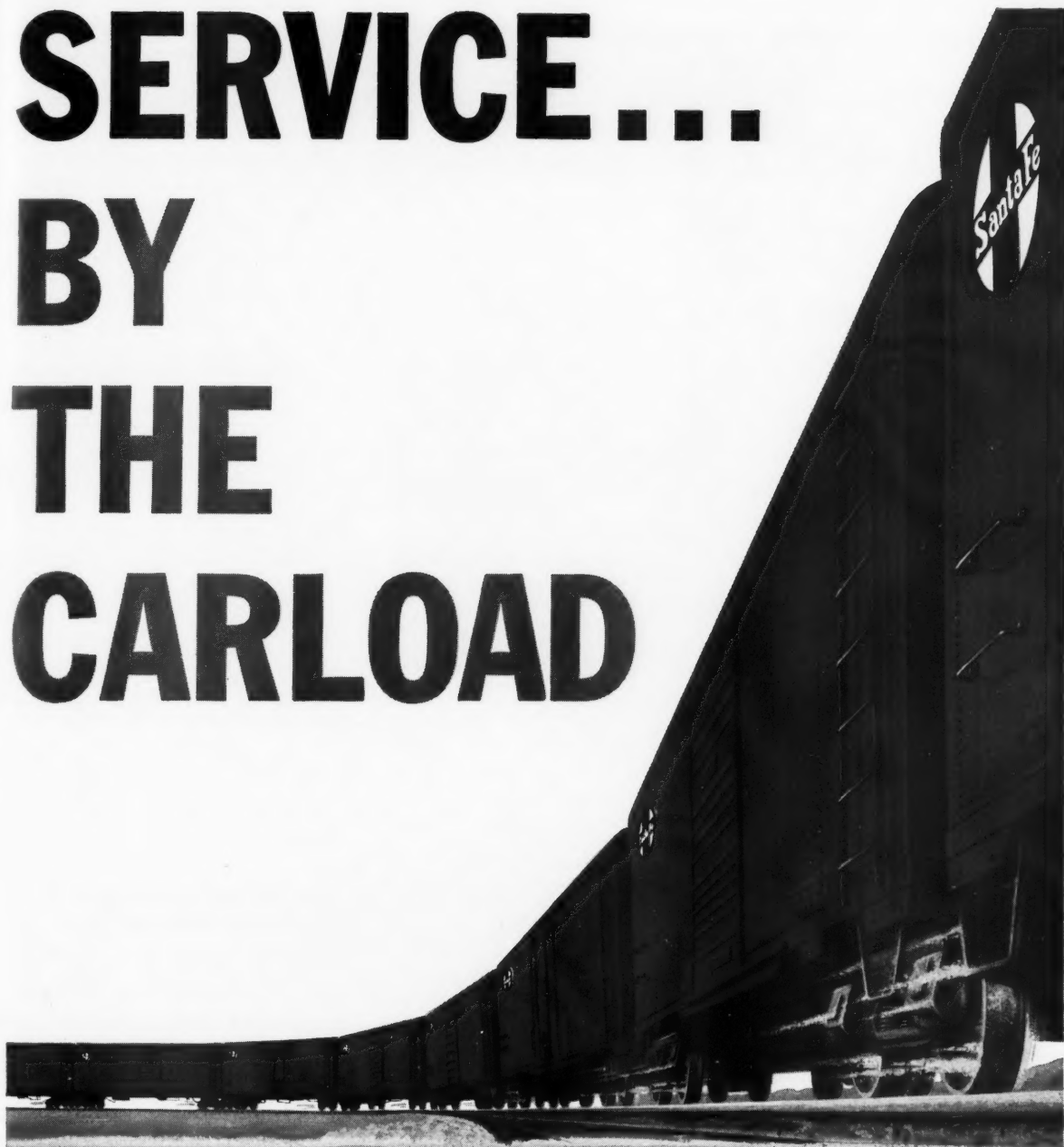
One day Tom Leeper was caught smoking in a prohibited area and he was fired on the spot. He pleaded guilty all right, but asked the arbitrator to lessen the penalty because this was his first offense. The management was adamant.

**Was The Company: RIGHT ☐ WRONG ☐**

**What Arbitrator Charles H. Logan ruled:**

"Under ordinary circumstances, the extreme penalty is seldom meted out because of a single error. Here the circumstances are not ordinary, but, to the contrary, are most extraordinary. To deliberately court the danger of explosion is to court self-destruction. Infinitely worse, it is to court the visitation of death and immeasurable suffering on fellow employees and upon their families. The discharge of Tom Leeper was justified."

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## FARM CHEMICALS

### Business & Management

#### IMC OPENS SKOKIE A&R CENTER



HELICOPTER hovers above heliport at the new Administrative & Research Center of IM&CC. Buildings shown are, left to right, operations building, operations annex, administration building, employees' lounge and cafeteria.

International Minerals & Chemical Corp. formally opened its \$5 million Administrative and Research Center in suburban Skokie the week of September eighth with a series of open houses. The center comprises five buildings just completed and a research center built on the 21-acre site in 1951. At the center are about 600 employees, who moved in June.

Designed by Perkins & Will, Chicago architectural firm, the center—the newest addition to the expanding greater Chicago skyline—has been described as a new and unique concept in business environment. It fronts on a central plaza with patio and reflecting pool, and is landscaped to create a campus atmosphere.

Its own heliport, located atop the administration building, puts the city's major airports only minutes away. The central five-story administration unit is the first office building in the country with heliport incorporated in the original design.

In addition to the administration building, there are a three-story building housing the staff and operating divisions, a one-story electronic center, a one-

story employees' lounge and a one-story cafeteria building. Turner Construction Co. was the general contractor.

The company started in 1909, producing phosphate and mixed fertilizer, and has grown from \$5 million in annual sales then to more than \$100 million now, with 90 per cent of that gain coming since the corporation moved its headquarters to Chicago from New York in 1941.

The buildings incorporate maximum efficiency of arrangement—providing 89 per cent usable space in the office floors. The total gross square footage is 187,046.

#### DUPONT BUYS CORNWELL SULFURIC ACID PLANT

Cornwell Chemical Corp.'s idle sulfuric acid plant at Cornwells Heights, Pa., has been purchased by DuPont Co.

This facility will become part of DuPont's Grasselli Chemicals Dept.

Located near Philadelphia, the plant has not operated for some time, and modification of certain equipment will be necessary, DuPont said. Production is expected to begin about the end of the year.

#### FORESTRY MANAGEMENT SCHOOL FOR FERT. MEN

A special school for forestry management was held Sept. 3-5 at Pack Forest, Wash., to acquaint members of the fertilizer industry in the Pacific Northwest with problems encountered by the forestry trade and to relate these problems to fertilizer potential.

The three-day outing was sponsored by the University of Washington and the National Plant Food Institute. School participants slept in bunk houses and ate at the Pack Forest camp.

Among the topics covered at the camp were "Forestry Today," "Tree Farm Forestry," "Forest Site and Forest Measurements," "Use of Aircraft in Forestry," "Status of Forest Research and Future Needs," "Forest Tree Physiology," "Forest Genetics," "Forest Soils," "Forest Tree Nutrition" and "Extension Forestry."

#### NEW ARMOUR FLA. UNIT SCHEDULED TO OPEN SOON

Armour & Co.'s new fertilizer works near Davenport, Fla., is expected to begin operation in late October or early November, according to a recent report.

#### DOW BRITISH SUBSIDIARY WILL MAKE PESTICIDES

A new subsidiary of Dow Chemical Co., Dow Agrochemicals Ltd., has been formed to manufacture and distribute farm chemicals in Great Britain.

Dr. Walter E. Ripper has been named director of the new company, which will make and market Dowpon herbicide, and eventually other farm chemicals.

#### COOP BANK OK'S PLANS FOR NEW NITROGEN UNIT

Plans for the proposed Valley Nitrogen Producers plant to be built in or near Fresno have been approved by the Berkeley Bank for Cooperatives, reports the California Farm Bureau.

Valley Nitrogen Producers, Inc., a farmer cooperative, plans to manufacture and distribute anhydrous ammonia, solutions and ammonium sulfate.





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### ROBERTS CHEM. IN CONTEMPT ON DITHANE PATENT

A ruling by U. S. District Court for the Southern District of West Virginia holds Roberts Chemicals, Inc., Nitro, W. Va., in contempt of court for violation of an injunction designed to stop infringement of the patent under which Rohm & Haas Co. sells its Dithane brand fungicide. Concurrently, Judge Ben Moore states that a temporary restraining order against Rohm & Haas will be dissolved.

### NEW CUBAN COMPANY WILL PRODUCE PLANT FOOD

A company has been organized in Cuba for production of anhydrous ammonia, nitric acid, ammonium nitrate, urea, ammonium sulfate and nitrogen solu-

tions, the U. S. Department of Commerce said in *Chemical and Rubber Industry Report*.

Site of the plant is Matanzas. It is expected to be in operation within two years.

Most of the output will be used for fertilizers, although some ammonium nitrate and urea may be used in commercial explosives and plastics. Source of hydrogen for ammonia production will be Bunker C or other fuel-oil residues from expanded petroleum refinery operations in Cuba, supplemented by imports.

### SHELL BUILDS AUSTRALIAN SULFURIC ACID PLANT

A A£500,000 sulfuric acid plant is being built by Shell Chemical (Australia) Proprietary Ltd. at the Shell Oil Co. refinery at Geelong, Victoria, the *Journal of Commerce* recently reported.

Said to be the first of its kind in the southern hemisphere, the plant is expected to be operating by the end of the year.

### PROCESS CHEMICALS DEPT. CREATED BY CYANAMID

Formation of a Process Chemicals Dept. by its Industrial Chemicals Div. has been announced by American Cyanamid Co.

The new department was created through merger of the company's Heavy Chemicals and Manufacturers Chemicals Departments. Among the chemicals it will handle are cyanamide and its derivatives—dicyandiamide and melamine—alum and acids, phthalic and maleic anhydride, surface active agents and cyanuric chloride.

H. C. Milton has been named manager of the department and R. M. Goddard, sales manager. Hilton had been manager of the Manufacturers Chemicals Dept. and Goddard, assistant manager of the Heavy Chemicals Dept.

Principal office and eastern regional headquarters of the Process Chemicals Dept. will be in New York City. In addition, there will be a western regional headquarters in Chicago and sales offices in 17 cities.

### FERTILIZER INDUSTRY AIDS 4-H CLUBS

Thirty-five companies had contributed to the work of the National 4-H Club Foundation as of mid-August, in response to an invitation from R. E. Bennett, president of Farm Fertilizers Inc. and the National Plant Food Institute.

Bennett served as fertilizer industry chairman for a fund raising program in behalf of the 4-H Foundation which began in June and continued through August.

### DOW OPENS KANSAS CITY FUMIGANTS TERMINAL

A new grain fumigants terminal of The Dow Chemical Co. began operations in Kansas City, Kansas last month. It includes blending, packaging and warehousing for a complete range of space and liquid fumigants for the grain trade, Dow reports. Inter-State Oil Co. is operating the terminal for Dow.

Facilities also include a complete testing laboratory.



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ON THE FARM • AT HOME • IN THE PLANT



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## MICHIANA CHEMICAL TO MAKE, MARKET FERTILIZER

A new company, Michiana Chemical Co., has been formed in Niles, Mich., to manufacture and distribute fertilizers to dealers and growers in southwestern Michigan and northern Indiana.

Alf H. Oines is president of the company and Robert W. Freske is vice president and general sales manager.

Bruce Construction Co. is builder of the plant, located at the New York Central Yards in Niles. The company expected to begin operation in September, making shipment in both bulk and bags. Plant capacity is about 20,000 tons of mixed fertilizers a year.

## RATH PACKING CO. ADDS GRANULATING FACILITIES

Mixed fertilizer granulating facilities are being installed at Rath Packing Co.'s Waterloo, Iowa plant. The unit will include

## FRONTIER'S NEW PACKAGE



Frontier Chemical Co. has adopted a new package design for benzene hexachloride. The company reports it sells about 15 per cent of the total national production of the chemical.

## USDA PUBLISHES 'LAND' YEARBOOK

What is happening to land in the United States—which some Americans consider our No. 1 economic and social development—is treated from many angles in *Land*, the 1958 Yearbook of Agriculture, published September 28.

The 67 chapters in the 605-page illustrated volume were written by 93 authorities, who tell in nontechnical language how we acquired our domain; its importance in history; the extent and values of Indian, state and public lands; land uses and problems in Alaska, Hawaii, Puerto Rico and each section of the continental United States; forested lands; and the acquisition of land for military purposes, highways, subdivisions and airports.

Major attention also is given to economic aspects of land tenure—types of ownership, valuation, appraisals, credit, insurance, buying and selling property, taxes, effects of farm programs, individual rights to

control land, conservation, the real-estate market and income from farmland.

This Yearbook has two special picture sections. One shows the history of our land use from the landing of the colonists to the present. The other shows the use of air-photos in determining the extent of changes in land use. Many charts, maps and tables are included.

The Yearbook of Agriculture is a Congressional document, and each Senator and Representative in Congress has a limited number of copies for distribution. The Department of Agriculture has none available for general distribution.

Copies of *Land* may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for \$2.25 each. Requests for copies should not be sent to the Department of Agriculture.

a TVA type ammoniator, dryer, cooler and screening equipment to produce high analysis granular fertilizers with a particle size range between 6 mesh and 16 mesh.

The plant, which is being engineered and fabricated by D. M. Weatherly Co., is expected to be completed by the end of November.

## HOOKER ESTABLISHES PHOSPHORUS DIVISION

Hooker Chemical Corp. has announced the new designation "Phosphorus Division" for the four plants formerly operated by Shea Chemical Corp., merged into Hooker on May 29, 1958. The plants are at Adams, Mass.; Columbia, Tenn.; Jeffersonville, Ind.; and Dallas, Tex.

General manager of the division is Oscar D. Crosby. John B. Sutcliffe has been appointed general sales manager of the division, Percy T. Brewbaker, division traffic manager, and Edward J. Bissailon, division engineer.

## MAGNOLIA CHEMICAL BUILDS NEW DALLAS FACILITIES

Construction has begun on a new 22,500-square-foot factory, warehouse and office building for Magnolia Chemical Co. in the Brook Hollow Industrial District in Dallas, Tex.

Tom Hanley, president of Magnolia, said the new building is part of a nation-wide expansion of the company's operations. It will double the size of the firm's Dallas facilities.

In business for 27 years, Magnolia manufactures and distributes insecticides, heavy chemicals, floor waxes and cleaners.

About 40 persons will be employed in the new building, which is expected to be completed about November 1.

## NEW DAVISON TRADEMARK

W. R. Grace & Co.'s Davison Chemical Div. has adopted "Hi-Flo" as its trademark for triple superphosphate products processed at Bartow, Fla.

\*Trademark applied for.



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## FARM CHEMICALS

### People

#### American Potash & Chemical Corp.



Gessner

Henry Gessner joins the firm as assistant export manager. With headquarters in the New York office, he will be in charge of company exports

to Central and South American countries.

Allen T. Fuller, Jr., has been appointed sales manager for the National Northern Div. of AP&CC, and Roland E. Tornquist, assistant to the treasurer.

#### Commercial Solvents Corp.

Albert P. Guill has been named western field representative for the Market Development Dept. Formerly chief chemist of the Terre Haute plant laboratories, Guill will now make his headquarters at the company's Los Angeles, Calif. district office.

**Best Fertilizers Co.** Eugene L. Knickrehm and Francis W. Johnson have been appointed ammonia department head and assistant for ammonia, respectively.

#### California Spray-Chemical Corp.

Election of Howard J. Grady to executive vice president and member of the board of directors of Cal-spray has been announced by A. W. Mohr, president. Grady will assist in overall



Grady

management of the company at its head office in Richmond, Calif. For the past ten years, he has been regional manager, marketing—east.

Otto R. Vasak has been transferred to South Plainfield, N. J., where he will be plant manager. Vasak joined Calspray almost seven years ago after many years in the chemical engineering field.

**Diamond Alkali Co.** Four executives of Diamond have been promoted: William H. McConnell, vice president—sales, now becomes vice president—marketing; Henry B. Clark, general manager of the Soda Products Div., is named director of sales, a newly created position; John W. Mantz, general manager of the Silicate, Detergent, Calcium Div., becomes general manager of the Soda Products Div. A new division, the International Div., will be headed by Samuel S. Savage, who has been director of export sales.

**Dow Chemical Inter-American Ltd.** Thomas G. Johnson has been named manager of the Buenos Aires, Argentina sales office. He had been assistant manager of the Montevideo office in Uruguay.

#### Du Pont, Grasselli Chemicals Dept.

New assignments for four men in biological chemicals sales: Merle E. Ward has been assigned to Wilmington, Del., as general product manager of agricultural chemicals, succeeding Jack M. Zimmerman who becomes assistant district sales manager, Houston, Tex. Dr. Dale E. Wolf transfers from assistant district sales manager in Philadelphia to the same position in Atlanta, and Eugene F. Clement,

who has been a sales representative in the intermountain area, moves to the Atlanta district.

**Hazleton Laboratories.** Dr. James S. Bowman, entomologist formerly with the Army Chemical Center, Edgewood, Md., has joined the Hazleton Laboratories staff. His work will be primarily in the field of agricultural chemicals. Under Dr. Bowman's guidance, the organization's 90-acre experimental farm will be expanded to include studies of plant disease and insect life.

**Hooker Chemical Corp.,** Phosphorus Div. Edward J. Bis-saillon is named assistant production manager; Barrett B. Brown, technical manager and Charles D. Crosby, purchasing manager of the new division.

**International Minerals & Chemical Corp.** has appointed Thomas F. Cook as district sales manager of its Plant Food Div., with headquarters in Tupelo, Miss. He will be in charge of a territory that includes Mississippi and western Tennessee.

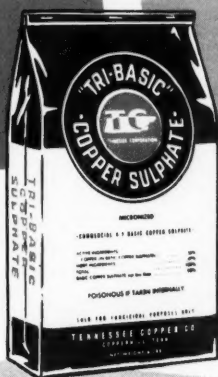
**Eli Lilly & Co.** Dr. Donald H. Ford has joined the Plant Science Dept. of the Agricultural Research Div. to conduct investigations in plant fungi and diseases. Entomologist Frederick D. Morrison has been named to assist Dr. Edward J. Campau, who supervises entomological investigations at the Lilly Agricultural Research Center.

**Michigan Chemical Corp.** Mark M. Frimodig has been appointed manager of the firm's new magnesium oxide plant at Port Ste. Joe, Fla.

**Minerals & Chemicals Corp. of America.** Robert Steinbruch has been named manager of contract research. In this position he will devote his activities to the utilization of M&C's research facilities for sponsored research and development work.

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Walker

ment with the University of Georgia, Dr. Laurence C. Walker has accepted a temporary appointment as chief forester for NPFU. He will be on leave from the University for this assignment. Dr. Walker's primary responsibility will be to summarize and evaluate forest fertilization work currently underway in the southeastern states and to explore the need for a coordinated program of research activities in this field. A six-man college-industry task force, to be appointed in the near future, will assist him.

**Potash Co. of America.** F. O. Davis, former executive vice president and treasurer, succeeds G. F. Coope as president of PCA. Coope, who is retiring under the company's established retirement policy, will remain on the board of directors and executive committee.



F. O. Davis



G. F. Coope

Davis has also succeeded Coope as president of Potash Co. of America, Ltd., wholly-owned Canadian subsidiary of PCA.

W. H. Bartlett, comptroller, has been named treasurer.

Since joining the company in 1936, Davis has served as comptroller, treasurer, managing director of PCA Ltd. and executive vice president. With his appointment as president, the managing director post of the Canadian subsidiary was eliminated.

**Retzloff Chemical Co.** Servando Trevino has been named international sales and technical service representative for Mexico.

**F. S. Royster Guano Co.** last month announced the election of C. F. Burroughs as chairman of the board; Charles F. Burroughs, Jr., as president; R. D. Cooke, Jr., as vice president and T. N. Gearreald as treasurer.

**Smith-Douglass Co.** E. Bruton Peacock has been appointed manager for the S-D Wilmington, N. C., operation. He is succeeded as manager at Kinston, N. C., by Walter Stroud, Jr.

E. Kendall Eakes has been named sales assistant to M. W. Darden, manager of the Norfolk branch.

**Spencer Chemical Co.** Joe Tuning has been named to co-



Tuning

ordinate URA-GREEN solution and anhydrous ammonia sales. Three men have been assigned to work with him in setting up the solutions sales and distribution program: Ray M. Mitteness and Darrell D. Martin will work in the areas to be served by production from the Henderson Works. Ned Haldeman will work in the area served by the Vicksburg Works.

**Stauffer Chemical Co.** George A. Cox, Jr., Robert M. Peters and Thomas M. Byrn have been named managers of the company's plants at Houston, Tex., Bayonne, N. J., and Harvey, La., respectively.

**United States Borax & Chemical Corp.** P. J. O'Brien becomes vice president, production and engineering, and R. F. Steel, vice president, finance and administration.

Steel, who was recently promoted from secretary and treasurer to assistant general manager, has been with the company for 12 years. O'Brien has served as gen-

eral manager of U. S. Borax and Chemical since 1956.

**United States Potash Co.** Sales Dept. changes: Darrel D.



Lowell

Lowell has been appointed to succeed Ben R. Pickering as sales representative for agricultural accounts in the northeast territory. A graduate of Kansas State College,

he has served with the U. S. Air Force for the past three years.

Pickering has been reassigned as sales representative for all industrial accounts.

**Velsicol Chemical Corp.** Appointment of Robert J. Kramer to the advertising staff has been announced by L. E. Carls, advertising manager. Kramer has been with Velsicol since 1952.

## Suppliers' Briefs

**Chase Bag Co.** will manufacture polyethylene tubing and sheeting in a complete range of widths and gauges. The company has acquired all polyethylene film extruding machinery and processes of Plax Corp., Hartford, Conn. Film and other materials will be converted into bags, liners and protective wrapping for foods, soft goods, agricultural and industrial products. According to a company spokesman, Chase will now offer an integrated service to users of polyethylene packaging, from extrusion of the film through converting and 6-color printing.

**Sturtevant Mill Co.'s** chairman of the board, William T. Doyle, delivered a paper on "The Dry Classification of Solids" at the Sept. 21-24 meeting of the American Institute of Chemical Engineers in Salt Lake City.

**Vulcan Steel Container Co.** appointments: Cothran C. Graves to southeastern regional sales manager and Fred L. Morris to sales-service representative.

## FARM CHEMICALS

### — Associations & Meetings —

#### SOUTHEASTERN FERTILIZER CONFERENCE THIS MONTH

Community-wide promotion of soil testing which led to improved fertilizer practices this year in two North Carolina counties will get considerable attention at the third annual Southeastern Fertilizer Conference in the Atlanta Biltmore Hotel, Atlanta, Georgia, Oct. 29-30.

Invitations to the conference, sponsored by the National Plant Food Institute, have been extended to representatives of all fertilizer manufacturers in the Southeast.

A banker, a county agent, a fertilizer dealer and a Chamber of Commerce representative will outline, in a panel discussion, the role each has played in "Acquaint-

ing North Carolina Farmers With Their Fertilizer Needs." The soil testing promotion project was carried out in Hoke and Scotland Counties, where North Carolina officials feel the program contributed greatly to maintaining fertilizer tonnages despite the reductions in cotton acreage. Dr. J. W. Fitts of North Carolina State College will moderate the panel discussion.

Members of NPFI's Southeastern Regional Advisory Committee will meet before the conference. The Institute's Southeastern Regional Research and Education Committee, Southern Extension Agronomists and Southern Soil Research Committee plan to convene following the conference.

Industry members who served

on the committee that planned the program for the southeastern session were J. P. Champion, Jr., Albany Warehouse Co.; G. L. Dozier, Central Georgia Fertilizer Co. and H. V. Miller, Armour Fertilizer Works.

#### CONTROL OFFICIALS HOLD 12th CONVENTION OCT. 17

Evaluation and use of consumption statistics, labeling specialty fertilizers, mixed fertilizer materials and agricultural trends will be featured in talks at the 12th annual convention of the Association of American Fertilizer Control Officials in Washington, October 17.

Also on the program will be reports of investigators, including general terms; nitrogen products (organic and inorganic); phosphorus; potassium; calcium; magnesium and manganese; boron, zinc and copper; sampling bulk fertilizer; pesticides in fertilizers and specialty fertilizers. Special committees will present reports, officers for the coming year will be elected, and a Presidential Plaque will be presented to J. J. Taylor.

#### FERTILIZER SECTION, NSC, TO MEET IN CHICAGO

A panel on *Accident Case Histories* will be one of the highlights on the program when the Fertilizer Section convenes in Chicago, Oct. 20 and 21 during the National Safety Congress.

Participants in the discussion are C. K. Brutcher, Davison Chemical Co.; C. S. Griffith, Virginia-Carolina Chemical Corp.; John S. Mark, Farm Bureau Cooperative Assn.; Stratton M. McCargo, G. L. F. Soil Building Service; Gaither T. Newnam,

Smith-Douglass Co.; A. I. Raney, Phillips Chemical Co.; W. D. Smith, Southern States Cooperative; and W. A. Stone, Wilson & Toomer Fertilizer Co. Discussion leader is J. Lauren Shopen, Consumers Cooperative Assn.

Talks will be presented on *A Challenge in Safety Training*, by W. C. Creel, North Carolina Dept. of Labor; *Accident Reporting and Analysis*, John E. Smith, Spencer Chemical Co.; *The So-Called Accident-Prone Individual*,

Dr. John H. Foulger, E. I. duPont de Nemours & Co.; *Safe Practices in Handling Ammonia and Nitrogen Solutions*, Vernon Page, Sohio Chemical Co.; and *Brainstorming for Safety*, Arthur C. Studt, Hotpoint Co. U. S. Steel Corp's film, "Knowing's Not Enough!" will be shown.

General chairman of the section is George F. Dietz, of Fertilizer Manufacturing Cooperative, Inc. George L. Pelton, Smith Agricultural Chemical Co. is assistant chairman.

G. F. Dietz



G. L. Pelton



C. S. Griffith



S. M. McCargo



A. I. Raney



W. D. Smith



## 18 YEARS OF RESEARCH REVIEWED AT MICHIGAN

Michigan State University soils scientists reviewed for fertilizer industry members results of 18 years of research on crop rota-

tions, fertilizer applications and fertilizer materials at a Field Day last month.

Tours were taken of the 40 acres of research plots on the Ferden Farm, near Chesaning, Mich. Experiments on plow-planting and minimum tillage practices were viewed, along with a new research project which helps determine the value of gypsum in normal superphosphate and sulfur

in ammonium sulfate.

The effect of crop sequence in the rotation on crop yields was explained by the researchers. They also considered the effect of sawdust as a soil amendment and the levels of fertilizer application needed to produce profitable increases in yield.

## CALIF. FERTILIZER ASSN. TO CONVENE IN NOV.

Credit problems and the economics of fertilizer use are among the topics on the program for the 35th annual convention of the California Fertilizer Association, to be held at the Ambassador Hotel, Los Angeles, Nov. 9-11, 1958.

During the morning business session on Nov. 10, Dr. Russell Coleman, executive vice president of the National Plant Food Institute, will speak on the economics of fertilizer use. Roy Kennedy, general credit manager of California Spray-Chemical Corp., will discuss credit problems in the fertilizer industry.

Presiding at the business session will be CFA President William G. Hewitt. Reports by M. E. McCollam, chairman of the association's Soil Improvement Committee, and General Manager Sidney H. Bierly will outline past year's activities and plans for 1959.

Ronald Reagan, motion picture and television star, will speak following the luncheon for delegates and ladies on November 10.

Information concerning the convention is available from Sidney Bierly, CFA, 475 Huntington Drive, San Marino 9, Calif.

## CIA ELECTS OFFICERS

The Chemical Industry Association has elected Paul E. McCoy, district manager of market development for American Potash & Chemical Co., its president.

Vice president is Fred A. Escherlich, Socony Mobil Oil Co.; treasurer, Pauline Newman, Food Machinery & Chemical Corp.; secretary, Erhart K. Drechsel, Escambia Chemical Corp., and assistant to the president, Ken Scott, Celanese Corp. of America.

## CALENDAR

**Oct. 13.** Agricultural Research Institute panel on problems related to agriculture in the fertilizer producing industry, Academy of Sciences Bldg., Washington, D. C.

**Oct. 14-15.** Western Agricultural Chemicals Assn. annual meeting, Villa Hotel, San Mateo, Calif.

**Oct. 16.** National Plant Food Institute conference on chemical control problems, Shoreham Hotel, Washington, D. C.

**Oct. 17.** Assn. of American Fertilizer Control Officials annual meeting, Shoreham Hotel, Washington, D. C.

**Oct. 20.** Sales clinic of Salesmen's Association of the American Chemical Industry, Roosevelt Hotel, New York City.

**Oct. 20-21.** Fertilizer Section, National Safety Council annual fall meeting, LaSalle Hotel, Chicago.

**Oct. 21-26.** Conference on Stored Grain Insects and Their Control, Kansas State College, Manhattan.

**Oct. 22-24.** Pacific N. W. Plant Food Assn. annual meeting, Gearhart, Ore.

**Oct. 27.** Western Range Fertilization Conference sponsored by National Plant Food Institute and Soil Improvement Committee, California Fertilizer Association, River-view Country Club, Redding, Calif.

**Oct. 28.** Assn. of Consulting Chemists & Chemical Engineers annual meeting, Biltmore Hotel, New York City.

**Oct. 28-29.** Northwest Garden Supply Trade Show, Masonic Temple, Portland, Ore.

**Oct. 29-31.** 25th annual meeting, National Agricultural Chemicals Assn., General Oglethorpe Hotel, Savannah, Ga.

**Oct. 29-31.** Entomological Society of Canada and of Ontario meeting, Ontario Agricultural College, Guelph, Ontario.

**Oct. 29-30.** Southeastern Soil Fertility conference, Atlanta Biltmore Hotel, Atlanta, Ga.

**Nov. 4-6.** Canadian National Packaging Exposition sponsored by Packaging Assn. of Canada, Automotive Bldg., Exhibition Grounds, Toronto, Ont.

**Nov. 5-7.** Fertilizer Industry

Round Table, Mayflower Hotel, Washington, D. C.

**Nov. 9-11.** Calif. Fertilizer Association 35th annual convention, Ambassador Hotel, Los Angeles.

**Nov. 10-11.** Agricultural Aviation Research conference, Milwaukee.

**Nov. 11-14.** National Aviation Trades Assn. 19th annual convention, Pfister Hotel, Milwaukee, Wis.

**Nov. 11-13.** 20th annual New York State Insecticide and Fungicide Conference and 11th annual Pesticide Application Equipmt. Conference, Bibbins Hall, Cornell University, Ithaca.

**Nov. 16-18.** National Fertilizer Solutions Assn. Convention, Netherland Hilton Hotel, Cincinnati.

**Nov. 18-20.** Washington State Weed Conference, Moses Lake, Wash.

**Nov. 19-20.** Carolinas-Virginia Pesticide Formulators Assn. annual meeting, Carolina Hotel, Pinehurst, N. C.

**Nov. 20-21.** Commercial Chemical Development Assn. joint meeting with National Agricultural Chemicals Assn., Lord Baltimore Hotel, Baltimore, Md. and Beltsville, Md.

**Nov. 24-25.** Eastern Branch, Entomological Society of America annual meeting, Lord Baltimore Hotel, Baltimore, Md.

**Dec. 1-4.** Annual meeting of Entomological Society of America, Hotel Utah, Salt Lake City.

**Dec. 3-4.** North Central Weed Control conference, Netherland Hilton Hotel, Cincinnati, O.

**Dec. 3-4.** Soil Fertility and Plant Nutrition Short Course, College of Agriculture, University of Missouri, Columbia.

**Dec. 3-5.** Agricultural Ammonia Institute annual meeting, Morrison Hotel, Chicago.

**Dec. 8.** Soils and Fertilizer Short Course, Coffey Hall, University of Minnesota Institute of Agriculture, St. Paul.

**Dec. 9-11.** Annual meeting of Chemical Specialties Mfrs. Assn., Commodore Hotel, New York City.

**Dec. 17-18.** Beltwide Cotton Production Conf., sponsored by National Cotton Council, Rice Hotel, Houston, Tex.

### DEVELOP BETTER METHODS FOR DEMONSTRATIONS, COMMITTEE ADVISES NPFI

The National Plant Food Institute should concentrate its efforts on developing effective fertilizer demonstration techniques and on developing better methods to utilize and promote demonstrations.

That is the opinion of members of the Northeastern Research and Education Committee. They feel that the institute can render more valuable service by developing and encouraging development of better demonstration *methods* than by using its funds directly to help establish demonstrations.

They also believe that as more effective techniques are developed, local groups—working with appropriate agricultural agencies—should and would support the actual demonstrations.

At a recent meeting in New York City, the committee reviewed NPFI's current programs of research and education in the Northeast. T. R. Cox of American Cyanamid Co. was elected to a two-year term as chairman.

Cox also will serve as the official representative to the National Steering Committee. Perry Onstot, Davison Chemical Co. div. of W. R. Grace & Co., was named alternate representative to the steering body. Dr. W. H. Garman, NPFI northeastern regional director, was elected secretary of the Northeastern committee.

Garman, W. R. Allstetter, vice president, and Merle Adams, northeastern district representative, represented the institute. Committee members present included W. E. Angstadt, Reading Bone Fertilizer Co.; Dr. Murray McJunkin, U. S. Steel; George Serviss, G. L. F. Soil Building Service; Dr. Harvey Stangel, Nitrogen Div., Allied Chemical Corp.; Cox and Onstot; and Dr. E. S. Younts, American Potash Institute, who represented Dr. E. T. York. Other committee members include Myron Keim, Virginia-Carolina Chemical Corp.; R. W. Donaldson, The Hubbard-Hall Chemical Co. and George Lippincott, Dorchester Fertilizer Co.

OCTOBER, 1958



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### AGRICULTURAL EDITORS TOUR FERTILIZER PLANTS

A tour of selected fertilizer industry operations in the Intermountain and Pacific Coast areas was conducted Sept. 7-12. Guests who participated in the tour, sponsored by the National Plant Food Institute, included farm magazine editors and land-grant college editors.

Fertilizer installations for the educational tour were selected so that guests could obtain a representative view of the industry within the area. Only one plant of each type was visited.

Itinerary for the six-day tour included visits to the large-scale distribution operations of Barber and Rowland at Woodland, Calif.; Shell Chemical Corp.'s nitrogen plant at Shellpoint, Calif.; California Spray-Chemical Corp.'s nitric phosphate plant at Richmond, Calif.; Swift & Co.'s mixed fertilizer plant at Hayward, Calif.; potash reserves and refining facilities of American Potash & Chemical Corp. at Trona, Calif.; Western Phosphates' plant at Garfield, Utah; J. R. Simplot Co.'s mines near Pocatello, Ida. and the Westvaco Mineral Products Div. of Food Machinery and Chemical Corp. electric furnace operation at Pocatello.

Louis H. Wilson, secretary and director of information, Dr. Richard B. Bahme, western regional director, and F. Todd Tremblay, Pacific Northwest regional director, accompanied the group on the western circuit.

### ECONOMICS THEMES FOR INDUSTRY ROUND TABLE

Economics of preventive maintenance, of processing and of formulation will be themes for the Fertilizer Industry Round Table, to be held at the Mayflower Hotel in Washington, D. C., November 5-7.

Dr. Vincent Sauchelli, chemical technologist for the National Plant Food Institute and chairman of the session, will open the

## STORED GRAIN INSECT CONFERENCE AT KANSAS STATE COLLEGE

If your work is in the formulating, sale, distribution or use of insecticides for stored grain insects, you'll be interested in a meeting at Kansas State College this month, the Conference on Stored Grain Insects and Their Control, Oct. 21-26.

The program presents relatively nontechnical and informal discussions of stored grain insects problems. First it concerns those basic facts and principles related to the insects themselves. Special attention is given to their structure, behavior and habits and to their damage to grain. A second and major part of the program is given to control measures, especially fumigation. The variable conditions that affect the success of control procedures are stressed.

The speakers are staff members of the Stored Grain Insects Laboratory, Agricultural Marketing Service, USDA of Manhattan and the Department of Entomology of Kansas State College, as well as Richard T. Cotton (retired) and Herbert H. Walkden, Stored Products Insects Div., USDA, Washington, and Harry Converse, Handling and Facilities Research, AMS, USDA.

Topics on the program include growth and development of insects, methods for detecting insect infestations inside the grain kernels, grain damaging dermes-

tids, the identification and habits of the common stored grain insects, protective treatments to grain, methods of application of fumigants, fumigation efficiency as affected by the chemicals used, safe handling of fumigants and federal and state controls with respect to labeling, selling and residues.

Application for admittance to the conference should be made to Conference Coordinator, Department of Continuing Education, Umberger Hall, Kansas State College, Manhattan, Kansas, on or before October 15. All applications should be accompanied by a fee of \$10: checks or money orders should be made payable to Kansas State College. The fees are to cover costs of the banquet, hand-out materials, refreshments and incidental expenses.

For further information about the conference, contact Donald A. Wilbur, Department of Entomology, Fairchild Hall, Room 302, Kansas State College, Manhattan, Kansas. Phone number: Prescott 68811, Ext. 329.

Sponsors of the conference are Kansas State College; Stored Grain Insect Laboratory, AMS, USDA, Manhattan, Kansas; Kansas Wheat Improvement Association and Kansas Grain and Feed Dealers Association.

meeting, reviewing briefly previous round table proceedings.

Ten questions relating to the *Economics of Preventive Maintenance* will be answered during the Nov. 5 session. "Engineering Principles Governing Maintenance" will be presented.

On Nov. 6, a discussion of "General Principles of the *Economics of Processing*" will be led by G. F. Sachsel of Battelle Memorial Institute. The group also will consider the "Superintendent's Responsibility in Plant Operation." Fourteen questions pertinent to the theme will be discussed. After lunch, W. F.

Jacobi of Union Bag-Camp Paper Corp. will present results of "Union Bag-Camp Study on Bagging and Bags," followed by further discussion of questions and problems associated with the theme.

Discussion leader for "Principles Governing *Economics of Formulation*" on Nov. 7 is Frank T. Nielsson of International Minerals and Chemical Corp. Appointed members will discuss 13 questions.

Dr. Sauchelli says this year's round table provides more time for discussions from the floor and for visiting between sessions.



# Arcadian® News

Volume 3

For Manufacturers of Mixed Fertilizers

Number 10

## ***New Ammoniation Technique Yields—***

# **UP TO 16% NITROGEN IN MIXED FERTILIZERS ALL FROM SOLUTIONS**

**For some time now** Nitrogen Division, Allied Chemical, technical service men have been producing pilot plant quantities of high-quality, complete mixed fertilizers containing up to 16% nitrogen, with all the nitrogen derived from Nitrogen Solutions. These high-nitrogen grades can be economically produced in good physical condition.

The ammoniation technique involves the use of sulphuric acid with selected NITRANA® Nitrogen Solutions and no other nitrogen carrier. Certain modifications of standard ammoniating equipment are essential in this development, however as much standard apparatus as possible was used in the procedure. Operating techniques, with guides as to type

of Solution, strength of acid, temperatures and other factors, have been worked out.

Based on these studies, several fertilizer manufacturers are planning to install equipment and preparing to use this new technique in their mixed fertilizer plants, with the advice and assistance of Nitrogen Division technical service men. They plan to produce such grades as: 14-7-7, 16-8-8, 14-0-14, 15-10-10, etc.

Development of this improvement represents another advance in the technique of manufacturing better fertilizers at lower cost. For information, contact Nitrogen Division, Allied Chemical, 40 Rector Street, New York 6, N. Y.

## 16-8-8 Produces Big Yields in Wisconsin Pasture Tests



**Spring top-dressing** of Wisconsin pastures with 500 pounds of 16-8-8 per acre this year produced as much as 7,650 pounds increase in dry weight forage yield and 5.63% higher protein content than unfertilized pastures. These huge yield increases on pasture tests supervised by Extension Specialist C. J. Chapman led him to say: "It was the most amazing demonstration I have seen in 42 years of extension work."

### College Recommends It

As a result, the University of Wisconsin is recommending that the fertilizer industry prepare to supply high-nitrogen 2-1-1 ratio fertilizers in the state next

spring. Professor Chapman plans to set up many additional 16-8-8 pasture demonstrations in 1959, to show Wisconsin farmers this highly profitable way to improve pastures.

The highest forage yield on the six test farms using 16-8-8 in 1958 was 9,487 pounds dry weight per acre, compared to 1,837 pounds without fertilizer.

With 16-8-8, the protein content of the forage tested 15.63% from a June 20 cutting. Samples taken earlier in the spring from pastures fed high-nitrogen mixed fertilizer have shown 20% or even higher protein content. Even at the figure of 15.63% protein, the farmer got the equivalent in pasture forage per acre of an extra 76½ bags of 15 to 16% dairy feed.

Professor Chapman feels that "a 2-to-1 ratio of nitrogen to phosphoric acid and potash more nearly fits the requirements of pasture grass on our silt and clay loam soils than a 1-1-1 ratio."

### Opens Steady Market

Years of pasture tests in Wisconsin have shown that 10-10-10 fertilizer produced big improvements in yield, protein, and early pasture turnout over no fertilizer or straight nitrogen. Now 16-8-8 or a 2-1-1 ratio promises even better yields and profits.

Some farmers have used 10-10-10 and straight nitrogen in alternate years, to get a similar effect. Under the new Wisconsin recommendation for 16-8-8 or a 2-1-1 ratio, fertilizer manufacturers will have a steady market for one analysis of fertilizer. Likewise farmers will have a steady supply of this ideal high-nitrogen pasture plant food combination. The 16-8-8 fertilizer is also excellent for lawns, golf courses and other tended turf markets.

## Fertilizer Sales are Stymied by Poor Application Methods



Modern rolling disk attachment for planters. Gives precise control of starter fertilizer placement.

**You might be surprised** if you checked on how many fertilizer sales you're *not* making because farmers in your area do not have the proper application equipment! Unfortunately, this sales bottleneck exists in every section of the country. And it has been all too effective in preventing the mixed fertilizer industry from reaching its full sales potential. We see dramatic proof of this in the starter fertilizer picture.

### Starter Fertilizer is Biggest Seller

It is generally conceded that mixed fertilizer is the best carrier of plant food for starter use. In fact, starter fertilizers—at recommended application rates—have demonstrated profitable response on *all* major crops—even where other fertilizer applications are heavy, and where soil



fertility is high. As a result, conservative estimates show that starter fertilizers make-up *more than two-thirds* of the total mixed fertilizer sold annually in the United States.

### Has Even Bigger Potential

And yet, despite this large percentage of gross fertilizer sales, starter products have only scratched the surface! In this country, there are many areas of heavy crop concentration, particularly in the Midwest corn belt, where *less than 10%* of the planters and seeders are equipped with starter fertilizer attachments. Even in sections where fertilizer has been used the longest, much of the starter equipment is of an obsolete type not adapted to do a good job of placement with modern fertilizers.

### Modern Equipment is the Answer

Today, most agronomists recommend placing starter fertilizer for corn two inches below and two or three inches to the side of the seed in single band applications. Old type split boot and shoe attachments cannot do this consistently. But it's no problem for the modern rolling disk attachment, introduced a few years ago. This device gives excellent control of placement, assuring better results under virtually all soil conditions.

Although college and trade groups have widely publicized this new starter fertilizer equipment, it is obvious that a major selling job still remains. Even in broadcast, top-dress and side-dress application a great proportion of the nation's farmers do not have the proper equipment for modern, mixed fertilizer. To repeat the point made earlier: mixed fertilizer has a *tremendous sales potential*—to be realized only when farmers have the proper application equipment!

### Who Will Do the Job?

Naturally, the responsibility for getting modern equipment to the farmer lies principally with the equipment manufacturer. But since mixed fertilizer benefits so directly, it behooves the industry to work closely with equipment manufacturers and dealers in promoting the use of better application equipment.

### How to Go About It

Right now you should be setting up a program for stimulating the sale of fertilizer equipment for use next spring. Make sure your salesmen are familiar with the types of fertilizer application equipment available to farmers in their

territories. Urge your salesmen and dealers to work with implement dealers in promoting sales of suitable equipment.

If farmers will not purchase the necessary application equipment themselves, try to get dealers to make equipment available on a rental or loan basis. Or you might arrange to have properly equipped custom operators cooperate with your sales program. In areas where implement

dealers are not active, you could encourage your dealers to take on a line of fertilizer application equipment as a service to their farmer customers.

Whatever you do to promote application equipment sales, you can be certain that it will be effort well spent. The pay off is direct: in more fertilizer sales for you . . . in customers more satisfied with your product!



## Best Way to Win Customers: Show Them Fertilizer Pays!

**The most effective way to keep a farmer sold on your fertilizer is to show him the actual profit figures on his own farm. It takes you only a few hours at harvest time, but it can be worth its weight in *extra sales* this winter and in early spring! For example, here is how you check corn yields—**

All you need is a steel tape, a bag and a scale. Follow this simple procedure:

1. Measure two 1/100th acre plots in each area: one from a well-fertilized area, and one from a check strip.

*1/100th acre equals:*

2 rows 36 in. apart and 72.6 ft. long  
or 2 rows 38 in. apart and 68.8 ft. long  
or 2 rows 40 in. apart and 65.4 ft. long  
or 2 rows 42 in. apart and 62.2 ft. long

2. Shuck every ear from each plot and weigh accurately. (3 pounds per check

strip is approximately 5 bushels per acre.) If the two checks per acre vary more than 15%, an additional check or two should be made, and the results averaged. Also, the corn stalks should be counted and recorded for each check made. Thin stands often do not respond to heavy fertilization.

3. Take an accurate moisture sample and convert to 15% moisture.

4. Figure yield according to this formula: Weight of sample (corrected for moisture) ÷ 70 x 100 = bushels per acre.

5. Compute yield difference and net profit from fertilizer.

You'll find it pays off in steady sales and *extra sales* to make these checks for *all* your new customers . . . and periodically for old customers. Start this fall!



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	CHEMICAL COMPOSITION %					PHYSICAL PROPERTIES			
	Total Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	Urea	Water	Neutralizing Ammonia Per Unit of Total N (lbs.)	Approx. Sp. Grav. at 60°F	Approx. Vap. Press. at 104°F per Sq. In. Gauge	Approx. Temp. at Which Salt Begins to Crystallize °F
<b>NITRANA®</b>									
<b>2</b>	41.0	22.2	65.0	—	12.8	10.8	1.137	10	21
<b>2M</b>	44.0	23.8	69.8	—	6.4	10.8	1.147	18	26
<b>3</b>	41.0	26.3	55.5	—	18.2	12.8	1.079	17	-25
<b>3M</b>	44.0	28.0	60.0	—	12.0	12.7	1.083	25	-36
<b>3MC</b>	47.0	29.7	64.5	—	5.8	12.6	1.089	34	-30
<b>4</b>	37.0	16.6	66.8	—	16.6	8.9	1.188	1	56
<b>4M</b>	41.0	19.0	72.5	—	8.5	9.2	1.194	7	61
<b>6</b>	49.0	34.0	60.0	—	6.0	13.9	1.052	48	-52
<b>7</b>	45.0	25.3	69.2	—	5.5	11.2	1.134	22	1
<b>URANA®</b>									
<b>6</b>	42.0	19.5	66.3	6.0	8.2	9.3	1.178	10	34
<b>10</b>	44.4	24.5	56.0	10.0	9.5	11.0	1.108	22	-15
<b>11</b>	41.0	19.0	58.0	11.0	12.0	9.2	1.162	10	7
<b>12</b>	44.4	26.0	50.0	12.0	12.0	11.7	1.081	25	-7
<b>13</b>	49.0	33.0	45.1	13.0	8.9	13.5	1.033	51	-17
<b>15</b>	44.0	28.0	40.0	15.0	17.0	12.7	1.052	29	1
<b>U-A-S®</b>									
<b>A</b>	45.4	36.8	—	32.5	30.7	16.2	0.925	57	16
<b>B</b>	45.3	30.6	—	43.1	26.3	13.5	0.972	48	46
<b>Anhydrous Ammonia</b>	82.2	99.9	—	—	—	24.3	0.618	211	—

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# READER SERVICE

**FREE INFORMATION** to help you  
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## Chemicals

### 257—POLYETHYLENE GLYCOLS

Of interest to the industry is the fully illustrated and detailed 54-page booklet on the properties, applications, storage, specifications and testing of Carbowax polyethylene glycols published by Union Carbide Chemicals Co., division of Union Carbide Corp. The glycols are water-soluble, non-volatile, unctuous liquids and solids used for water-soluble lubricants, cosmetics and ointments, emulsifying agents, adhesives and paper coatings.

The book contains data for potential users and a table of physical properties including solubilities in common solvents and compatibilities with common ingredients of formulated products. Shipping data is condensed in a full-page table. Copies of the booklet may be obtained by

CIRCLING 257 ON SERVICE CARD

### 258—SPRAY ADJUVANTS

Colloidal Products Corp. says it has a complete line of effective agricultural spray adjuvants—for use with insecticides, herbicides, fungicides, defoliant and desiccants. In addition its seed coat is reported to provide superior adherence of seed protectant chemicals. For details on the products,

CIRCLE 258 ON SERVICE CARD

### 259—BROCHURE DESCRIBES SOLE-AMITES

Three grades of non-flux-calcined diatomaceous silicas available from Sole Chemical Corp.—Ag, Top and Super grades—are described in a new technical bulletin recently released by the company. Copies of the bulletin are available by

CIRCLING 259 ON SERVICE CARD

### 260—ANTARA SURFACTANTS

A free copy of "Antara Surfactants in Herbicides and Insecticides" is available from Antara Chemicals, Div. of General Aniline & Film Corp. The division supplies wetting agents, emulsifiers, spreaders, solubilizers and dispersing agents to the pesticide industry. For your copy of the booklet describing use of these products in formulations,

CIRCLE 260 ON SERVICE CARD

### 261—EMULSIFIER FOR AGRICULTURAL TOXICANTS

New information has been released by Nopco Chemical on Agrimul TL. A liquid blend of nonionic and anionic surfactants, it is soluble in water and xylene and dispersible in kerosene. Nopco claims that Agrimul TL gives instant emulsions with almost no creaming or oiling out, even under fairly extreme conditions. For details,

CIRCLE 261 ON SERVICE CARD

### 262—"CHOOSING THE RIGHT POLYGLYCOL"

Because of increasing customer interest in polyglycols, Dow Chemical Co. reports it has published a revised edition of "Choosing the Right Polyglycol." Polyglycols are high molecular weight compounds produced by reacting alkylene oxides with compounds having an active hydrogen. Dow foresees an unlimited number of variations of the polyols possible for many uses. Polyethylene glycol fatty acid esters have been used in the manufacture of DDT, chlordane, 2, 4, 5-T and 2, 4-D emulsion concentrates, and these esters are said to be suitable for many other spray uses. To get your copy of the 24-page booklet,

CIRCLE 262 ON SERVICE CARD

## Process Equip.

### 263—AIR-FLOAT TABLE

Sutton, Steele & Steele, manufacturers of air-flotation type separating equipment, are producing a new lab-sized unit called the V-135 Air-Float Table. It is adaptable for both product research and for continuous commercial processing involving separating, salvaging and upgrading of dry granular materials. According to Sutton-Steele the V-135 utilizes the firm's exclusive technique of dry separation by fluidization. It weighs 225 pounds, and measures 23½" x 34" x 24". Construction details, cost and typical operating capacities are available. Just

CIRCLE 263 ON SERVICE CARD

### 264—MICRONIZER BOOKLET

A new micronizer bulletin, similar to that released six months ago, is available from Sturtevant Mill Co. It includes information on an additional model now available. The booklet discusses the Micronizer's potential in fine-grinding, contains typical grinding information, steam and/or air requirements and schematic drawings of the unit. It also points out how firms may take advantage of Sturtevant's fine grinding laboratory for custom or experimental grinding work. The free brochure is yours by

CIRCLING 264 ON SERVICE CARD

### 265—CORBLIN PUMPS AND COMPRESSORS

Corblin diaphragm-type pumps and compressors are available with pressures from 50 to 15,000 psi and capacities up to 60 SCEM. They can handle all types of gases and liquids, reports American Instrument Co., distributor for the French line of pumps in this country. Complete information is contained in a bulletin available from American Instrument. For your free copy

CIRCLE 265 ON SERVICE CARD

### 266—ROTARY DRUM FILTER BULLETIN

Available without charge from Dorr-Oliver is a new 24 page, 2-color bulletin titled "The Oliver Continuous Rotary Drum Filter for the Process Industries." This comprehensive bulletin describes the designs of the five principal types of rotary drum units and their component parts.

### How to use the READER SERVICE CARD

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- Print or type your name, position, company and address.
- Clip and mail the Service Card.

Conventional accessories, auxiliaries, media and materials of construction are detailed. The bulletin also includes some 50 photographs and line and wash drawings of various filters and components as well as tables of sizes and capacities of each design. For your free copy

CIRCLE 266 ON SERVICE CARD

#### 267—C. E. PELLETIZER

A new brochure on its small pelletizing unit has been prepared for fertilizer manufacturers by Chemical Engineering Service, a division of Manitowoc Shipbuilding, Inc. The bulletin discusses the importance of flight arrangement in granulation, capacity of flights in granulators and pelletizers and their effect on production of finished product. A flow chart also is included. A copy will be mailed to you if you

CIRCLE 267 ON SERVICE CARD

#### 268—MEASURING FLOW IN LARGE PIPELINES

Schutte and Koerting Co.'s new bulletin describes ByPass Rotameters for measuring fluid rate of flow in pipelines 2 inches in diameter and larger. The bulletin also presents simplified, easy-to-follow instructions for determining the permanent pressure loss across the main orifice and the required straight run of pipe before and after the main orifice. Free copies are available.

CIRCLE 268 ON SERVICE CARD

### Materials Handling

#### 269—SELECTION GUIDE

A new 16-page manual, "A Guide to Proper Selection of Vibrating Conveyors for Bulk Materials," has been published by the Ajax Flexible Coupling Co. Inc., manufacturers of vibrating conveyors, feeders, screens and packers. The publication includes information on materials handling operations that can be performed simultaneously while conveying, flow charts, illustrations of different types of applications, capacities, dimensions and other selection data. Ajax will send you a copy if you

CIRCLE 269 ON SERVICE CARD

#### 270—"CONVEYOR CHAINS"

Chain Belt Co. recently published a new bulletin describing its conveyor chains for transporting small and moderate-sized

items and containers in various industries. The bulletin, "Conveyor Chains," carries information on eight types of Rex conveyor chains—Steel and Nylon TableTop Chain, Steel and Nylon PlateTop Chain, FlexTop and Crescent Top Chain and SM120 and 9250 Case Conveyor chains. For a copy of the bulletin, just

CIRCLE 270 ON SERVICE CARD

### Miscellaneous

#### 271—TWO-WAY VALVES

A new series of high-flow, two-way valves with  $\frac{3}{4}$ " and 1" diameter orifices have been introduced by Skinner Electric Valve Div. They complete an all new line of two-way valves introduced in January in  $\frac{3}{8}$ " and  $\frac{1}{2}$ " sizes. Designed to control such common media as air, oil and water, the L Series valves are smaller, more compact and lower in cost than the M2 Series valves they replace, says Skinner. The valves operate on a pressure differential of 5 to 150 psi and are available in standard and explosion-proof construction, normally open or normally closed. Additional information can be found in literature, obtainable by

CIRCLING 271 ON SERVICE CARD

#### 272—LEVEL CONTROLLER BULLETIN

Details of a compact pneumatic-electronic control device, said to detect and control charges in media level with exceptional precision, are given in a technical bulletin from Robertshaw-Fulton Controls Co. Consisting of a capacitance-sensitive probe and a controller, the Pneumatic Level Controller is claimed to be particularly valuable for application in vessels or small tanks which do not permit internal installation of conventional systems requiring large detection devices. Compatible media include hydrocarbons, oils, acids, aqueous solutions and many granular products. To obtain the technical bulletin,

CIRCLE 272 ON SERVICE CARD

#### 273—PFAUDLERTRON ELECTRONIC TESTER

A constant-voltage electronic tester, called Pfaudlertron, designed for non-destructive testing of surface continuity in glassed-steel equipment, has been introduced by The Pfaudler Co. Interior surfaces of glassed-steel vessels are occasion-

ally damaged as a result of severe mechanical impact and should be inspected when equipment is received, at the time of on-stream tie-in and whenever damage from physical impact or long term severe chemical service is suspected. The new tester consists of a self-contained control cabinet with direct reading meter on case, 25-foot probe cord, lucite handle containing neon indicator light and both brush and pointed probes. Details are available by

CIRCLING 273 ON SERVICE CARD

#### 274—THE NEW LEADER

New literature from Highway Equipment Co. describes its "New Leader" Model L-14S lime spreader. Steep sloping body sides, wide 24" conveyor and heavy conveyor chain provide fast, positive feed of material, and twin spinners give a wide, uniform spreading pattern, according to Highway. For additional information on the spreader,

CIRCLE 274 ON SERVICE CARD

#### 275—PESTICIDE SAFETY CHART

The problem of toxic pesticide handling is treated pictorially in a chart released by Willson Products Division.

The chart which illustrates 12 safety tips is yours by

CIRCLING 275 ON SERVICE CARD

#### 276—WET-STRENGTH PAPER

Developed especially for applications requiring superior wet-strength and excellent abrasion resistance, Knowlton Brothers' grade 538 nylon impregnated paper is not affected by acetone and many other chemicals, that firm reports. Heat and pressure can be applied to the paper to yield a very smooth finish and the paper still retains porosity. The paper's exceptional resistance to abrasion is said to be maintained in both wet and dry applications. Using a 10 CS wheel on a Taber Abraser, 20 revolutions make no impression in either the dry paper or paper soaked in water for twenty hours at room temperature. Tensile strength of a one inch strip before pressing is 58 crosswise and 88 lengthwise. After pressing, tensile is 92 crosswise and 118 lengthwise. Samples and more information are available by

CIRCLING 276 ON SERVICE CARD

#### 277—MYERS OFFERS RESEARCH SPRAYER

A new all purpose sprayer, designed to meet varied sprayer requirements in the field of research, is being introduced by The F. E. Myers & Bro. Co. Through the use of supports, the sprayer can be mounted on the drawbar or other accessible point, on agricultural tractors or can be truck or trailer mounted. It has a 25-gallon capacity tank with "fire-cured" epoxy coating, and a four-gallon-a-minute pump. A high pressure regulator provides a pressure range of 100 to 300 pounds psi and a low pressure regulator offers pressure ranges of 20 to 100 pounds psi. Further information is available by

CIRCLING 277 ON SERVICE CARD

FARM CHEMICALS

See pages 48 and 49 for information on these Reader Service Numbers:

278—New Payloader

280—Universal Conveyor

279—Munson Mills

281—Karbate Pumps

## Newly-Formed Canadian Fertilizer Association Convenes

Dr. R. T. Allman was elected president of the newly-formed Canadian Fertilizer Association during its first annual meeting at the Manoir Richelieu, Murray Bay, Que., Aug. 20-23.

Allman, president and owner of the Bradford Fertilizer and Chemical Co., stressed the need for such a national organization as the Canadian Fertilizer Association, in his opening remarks. "Problems such as tariffs, transportation rates and legislative regulations are active problems facing our industry today," he said. "And we will need the support of this association in dealing with them."

Speaking on the recent revisions to the Fertilizer Act, C. R. Phillips, head of the Fertilizer and Pesticide Unit of the Canadian Dept. of Agriculture, emphasized that wherever pesticides are custom-mixed by fertilizer manufacturers, the use recommendations must be acceptable to the Dept. of Agriculture.

### Future Demands

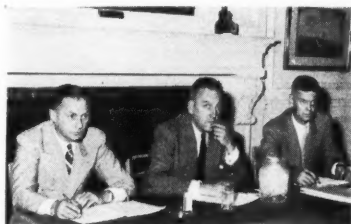
Dr. George Smith, director of Chemistry of the Soils and Fertilizer Services, Nova Scotia Dept. of Agriculture and Nova Scotia Agriculture College, pointed out the demands that will be made on agriculture in the future. "15 per cent of the farmers are producing 85 per cent of the produce sold off the land in the U.S.A. and Canada," he said.

"Within the next 25 years in the U.S.A. and Canada, we must produce crops to supply 40 million more people. And this must be done on a smaller land area than at present," continued Dr. Smith.

"This job will be done by our good farm managers who will overcome the present limiting factors of low soil fertility and high soil acidity. And these farmers will use substantially increased quantities of fertilizers and lime," he concluded.

The need for better use of effective planning legislation in dealing with expansion problems that will accompany St. Lawrence Seaway development was emphasized by Dr. E. G. Pleva, head of the Dept. of Geography, University of Western Ontario.

"The economics of the Seaway will accelerate urban development," he said. "And although



OFFICERS of CFA, left to right, are A. Lambert, 1st Vice Pres.; Dr. R. T. Allman, Pres.; D. M. Moffatt, Sec-Treas.

increased urban markets will aid Ontario agriculture, much of the finest land in Canada will be, and is being changed to suburban subdivisions, airports, super highways and industrial sites." The Province of Ontario, together with the Great Lakes states of the U.S., must develop increasingly effective means to steer non-agricultural-land uses to the lower grades of land, Dr. Pleva said.

Dr. Russell Coleman, executive vice president of the National Plant Food Institute, listed what he felt were three barriers limiting the proper use of fertilizers today—a lack of knowledge about fertilizers, particularly their economic values; fear of using too much fertilizer and damaging crops; and lack of adequate credit for financing.

### AVIATION TRADES ASSN. TO MEET NOV. 11-14

National Aviation Trades Association's 19th annual convention at the Pfister Hotel, Milwaukee, Wisc., Nov. 11-14 will be the first four-day convention in its history.

Nov. 12th sessions will be devoted to agricultural applicator activities and research, flight training, sales promotion problems and items of general concern to all operators.

Aerial applicators will study government contract problems, safety matters and regulatory proposals on Nov. 13th.

Program on Nov. 14th includes applicator business, sales and public relations, as well as election of officers.

Maintenance problems will be covered Nov. 11th by manufacturers' representatives, FFA and Defense Department personnel and service agency people.

BANQUET TABLE. A. Lambert, Dr. Russell Coleman, Mrs. Alex Mooney, W. Maxwell Ford, Alex Mooney and Mrs. W. Maxwell Ford.





## FARM CHEMICALS

### Equipment & Supplies

#### NEW HOUGH PAYLOADER HAS 7,000 LBS. CAPACITY



Frank G. Hough Co. has just announced a new four-wheel-drive, rubber-tired tractor-shovel with 7,000 lbs. carry capacity, the Model H-70. Already in production, the loader will replace the Model HH Payloader.

Features claimed for the H-70 include more power, more traction, stronger components, greater protection against dirt and dust, more efficient torque-converter, complete power-shift transmission, power-transfer differentials, power-steering, pry-out bucket action, safety boom arms, and power-booster brakes.

New gasoline and diesel engines provide from 105 to 110 hp. Diesel engines are available in either 2 or 4 cycle types.

Literature and complete specifications on this new unit may be obtained by

CIRCLING 278 ON SERVICE CARD

#### FIRM CALLS PLASTIC BAG TESTS "HIGHLY SUCCESSFUL"

A thorough testing program on its soon-to-be marketed heavy-duty polyethylene has just been completed by the Plastics Div. of Visking Co. Company officials said the overall results of the tests were "highly successful".

When bags made of 10-mil Visqueen heavy-duty polyethylene tubing were filled with seed or feed and dropped from a height of four feet from standing and moving positions onto various sur-

faces, breakage was kept to half the amount chalked up when multiwall bags were used. In performance tests Visking said the tubing was proved to be stronger and more moisture and chemical resistant than competitive packaging materials. Another advantage is its light weight and minimal storage requirement, said Visking.

#### VALVES PASS 5-YEAR TEST IN PHOSPHORUS SERVICE

Results of five-year-long field tests indicate that bronze lubricated plug valves are the answer to corrosion problems in handling molten phosphorus, reports The American Agricultural Chemical Company.

At the company's Carteret, N. J. plant, bronze Rockwell-Nordstrom lubricated plug valves have handled about 37,500 tons of molten phosphorus at a temperature of 76-84 degrees Centigrade. According to the maintenance supervisor, "maintenance for the valves has been absolutely nil." Operators report that there has been no difficulty with valves freezing or sticking. All that is required is an occasional shot of lubricant.

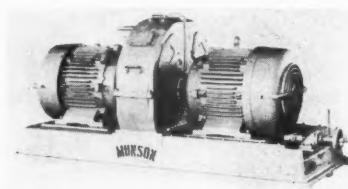


#### BALL BEARING ATTRITION MILLS FROM MUNSON

A versatile line of ball bearing attrition mills now is being offered by Munson Mill Machinery Co., according to T. Allen Powell, sales manager.

Bed of the company's attrition mill is a rigid, one-piece seasoned gray iron casting. The adjusting end of the machine slides out for inspection of interior and change of plates.

The bed casting contains the



discharge spout cast integrally. "Unique design of the discharge spout permits free flow of ground material and affords a convenient connection to conveying equipment," Powell said.

The redesigned mill eliminates the need of conventional bearing stands. Motors with oversize extra capacity bearings are designed to permit direct mounting of discs on the motor shaft. Powell said that as a result of improved design, bearing maintenance has been reduced to an absolute minimum.

For additional information on the new mills

CIRCLE 279 ON SERVICE CARD

#### NEW HANDIE TALKIES FOR PERSONAL COMMUNICATIONS

Motorola has introduced a "Handie-Talkie" pocket receiver and pocket transmitter, which it says adds a new dimension to 2-way mobile radio systems by extending easy communications capability to the man on foot.

The new pocket receiver picks up all radio signals on a systems frequency, making possible the immediate contact of key personnel. A second model of the pocket receiver now being field tested will provide a selective signaling feature. Measuring approximately 8 x 4 x 1½ inches, the new 46-ounce pocket transmitter also is in the operational field testing stage.

FARM CHEMICALS

### UNIVERSAL'S ROLLERLESS THROUGH-BELT CONVEYOR

Universal Hoist Co. says its new conveyor is suitable for all fine free-flowing material. Trouble-free service, less maintenance and low first cost are claimed for the Model K, because of its rollerless design. The 12" belt is pulled through a formed steel trough at up to 500 ft. per minute. Because material is carried on the belt, the unit cleans itself completely between each run.

By using a reversible motor, the conveyor can be run in either direction and when suspended from a track system, it can be shuttled back and forth as well as sideways.

Details are available.

CIRCLE 280 ON SERVICE CARD

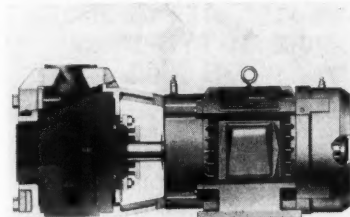
### CORROSION-RESISTANT PUMPS CAPACITY INCREASED

Three new sizes of corrosion-resistant centrifugal pumps—two with nearly twice the capacity of present models—have been added to its line of Karbate impervious

graphite pumps, National Carbon Co. reports.

Designated models 22-FAL, 28-FAL and 31-FAL, the pumps are equipped with 1-, 1½- and 2-hp, 1750-rpm motors. At this speed, the latter two types can deliver up to 150 gallons per minute, as compared to a top of 80 gpm for the previous type F Karbate pumps.

The two larger pumps are available with 3- or 5-hp motors for handling fluids of higher



specific gravity than water. Maximum total head for each of the new types is 33, 51 and 67 feet, respectively.

For further information on Karbate impervious graphite

pumps, including performance curves and prices,

CIRCLE 281 ON SERVICE CARD

### CORRUGATED CONTAINERS RESIST SKIDDING

The first corrugated containers with non-skid properties built right into the board at the papermill are being produced by its Packaging Div., states Olin Mathieson Chemical Corp.

The containers are designed to decrease product damage caused by container skidding and slippage on production lines, in transit, in handling and in warehouse operations. In addition, the company says warehouse personnel are protected because the containers hold more securely when stacked.

**SALE:** Horizontal Aluminum Tanks 4,000, 7,000 gallons. Steam Tube Dryers (Tubes Removable) 6' x 50', 6' x 30', 4' x 30'. Ribbon Mixers 336, 200, 75 cubic foot working capacity. Also Hammermills, Dewatering Presses, Conveyor, etc. PERRY, 1430 N. 6th St., Philadelphia 22, Pa.

## ASHCRAFT-WILKINSON CO.

Fertilizer  
Materials



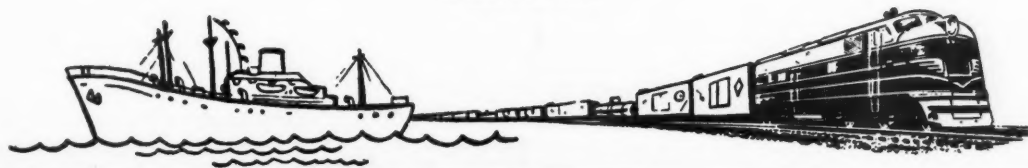
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## ONE NOZZLE, LESS WATER WORK IN SPRAYING COTTON

Cotton producers can use a lot less water in their insecticide sprays and still poison just as effectively.

This was discovered in tests at the Texas Agricultural Experiment Station and described by Associate Professor Lambert H. Wilkes at the Beltwide Cotton Mechanization Conference recently.

Using the same amount of active ingredient, insecticide was applied at rates of 2, 6 and 14 gallons per acre. Control with two gallons per acre was just as effective as higher rates, besides saving time and labor due to handling of a smaller quantity of water.

Smaller rates of water necessitated smaller spray orifice nozzles and extra care in mixing materials so they would not clog nozzles. The sprayer operator also had to be more careful to insure that all nozzles were functioning properly. Application rates of 2 to 8 gallons per acre now are being recommended.

### Boomless Nozzles

Experiments over a five-year period with a number of different arrangements of nozzles revealed one nozzle directly over each row to be just as effective as two or three per row.

"During the 1957 growing season," Wilkes reported, "three types of wide-swath or boomless nozzles were included in the nozzle tests. Two of the boomless nozzles were capable of covering a swath of six 40-inch (21 ft.) rows and the third was capable of covering a 12-row swath (42 ft.). Crosswinds affected distribution on windy days, especially with the 12-row nozzle. Yields at harvest, however, showed no difference between the wide-swath nozzle and the conventional low gallonage boom-type nozzles. Good penetration was obtained with all nozzles.

"Although the results from the

new boomless nozzles are encouraging," Wilkes cautioned, "it is felt that more research is needed to determine the effects of crosswinds on distribution of the material and the effects of droplet sizes on controlling insects before they can be recommended for the application of insecticides."

## TWO FERTILIZER SOLUTIONS ANNOUNCED BY SPENCER

Development of two new fertilizer solutions linking low salting-out temperatures and low free ammonia content to raw materials cost savings has been announced by Spencer Chemical Company. Spencer says this combination of properties will make a solution economical and practical to use in all parts of the country, regardless of weather.

Properties of the solutions, named SPENSOL 430 (20-68-6) and 440 (22-66-6), should enable granulators of mixed fertilizer to achieve significant savings, Spencer says. Reasons given are:

1. Less sulfuric acid will be required because of the low free ammonia content of the solutions.
2. Eliminating some of the sulfuric acid in a formula makes it possible to derive more  $P_2O_5$  from normal superphosphate. It also means less plant "smog" creation, a problem in many mixing plant areas.
3. In granulating low nitrogen ratios the low free ammonia of the solutions enables the mixer to use more low cost anhydrous ammonia as a nitrogen source.
4. The solutions contain only 6 per cent water, meaning less freight, less drying and recycle time.

SPENSOL 430 (43.0 per cent nitrogen) has a fixed nitrogen content of 62 per cent and a salting-out temperature of 14° above zero. SPENSOL 440 has a fixed nitrogen content of 59 per cent and a salting-out temperature of 17° below zero. According to the announcement, previous solutions with comparable salting-out temperatures contained fixed nitrogen

in a range from 48 to 54 per cent.

Both new solutions are named in accordance with the new solution nomenclature system recently recommended. (See story on next page.) The basic number denotes the percentage of nitrogen in the solution and the numbers in parentheses indicate the percentages of ammonia, ammonium nitrate and urea in the total nitrogen content.

The "dollars and cents" significance of linking a low salting-out temperature with a low free ammonia content was pointed out by Joe Sharp, Spencer's manager of Agricultural Technical Service. "The climate in which a mixer operates can have a sizable effect on his granulation costs," Sharp said. "The colder the climate, the lower the salting-out temperature of the ammoniating solution must be. Heretofore, producing a solution with a low salt-out temperature has required raising the free ammonia content, which then requires the mixer to add additional sulfuric acid to tie it up in the formula."

## CONTROL OF INSECTS THAT ATTACK BROCCOLI, CABBAGE

Four years of experiments are reported in a bulletin, *Chemical Control of Insects Attacking Broccoli and Cabbage*, published by the University of Maryland Agricultural Experiment Station. Following are some of the results reported in the bulletin:

"Malathion when applied at frequent regular intervals has given excellent control of cabbage looper, imported cabbageworm and cabbage aphid. In single experiments, *phosdrin*, *Thiodan* and *RE-4355* have shown great promise against the cabbage looper. Most of the phosphorus insecticides tested have shown considerable effectiveness against cabbage aphid and imported cabbageworm.

"Of the chlorinated insecticides tested, *Perthane* and *Toxaphene* were most effective against cabbage looper and both were highly effective against the imported cabbageworm. *Endrin*, the most effective insecticide tested, cannot be used during the harvest period because of residue restrictions but



can be safely used until heads or floret buds first appear.

"For commercial control a phosphate insecticide, *phosdrin*, *TEPP* or *malathion*, preferably the latter, should be applied regularly in a protective spray program. Since these insecticides all have a short residual period one of the effective chlorinated insecticides, *Perthane* or *toxaphene*, should be applied with the phosphorus material to provide a protective residue particularly over periods when spray schedules are likely to be interrupted by adverse weather conditions. Results here indicate that a combination of *malathion* and *Perthane* should be satisfactory in a commercial control program."

Carlos Kampmeier of Rohm & Haas Co., said that this report provides additional confirmation of the utility of mixtures of *Perthane* with a phosphatic insecticide to control insects attacking cole crops and lettuce.

#### **SOLUTION CODING SYSTEM VOTED BY INDUSTRY GROUP**

A special industry work group has recommended that the National Plant Food Institute adopt a new coding system, based on the customary N-P-K nomenclature, for naming nitrogen solutions.

In accordance with instructions from the Board of Directors, the Institute will have the coding system adopted as a standard in compliance with U. S. Department of Commerce procedure.

A producer, under the new system recommended by the committee, would prefix the code with his own company trade name; this would be followed by the total nitrogen content in percent, with decimal point omitted; next, in brackets, would follow the percentage composition, in sequence, of ammonia, ammonium nitrate, urea, and next, any other significant nitrogen component, all rounded off to the nearest whole number.

Under the coding system, a John Doe solution containing 41.2 per cent total nitrogen consisting of 22.2 per cent ammonia, and 65.0 per cent ammonium nitrate would be identified as follows:

John Doe Solution 412 (22-65-0).

The committee feels that the new system offers flexibility inasmuch as other components, for example sulfate of ammonia, can be designated simply by adding the letter S in the trade name and showing the percentage composition with a fourth digit in the bracket.

#### **DDT MOST ECONOMICAL AGAINST PINK BOLLWORM**

"DDT, currently the only insecticide recommended for pink bollworm control, continues to be the most economical insecticide to use," reported Dr. Dial F. Martin, head of USDA's Pink Bollworm section, during the Beltwide Cotton Mechanization Conference held recently in Brownsville, Tex.

Martin said that although progress has been made toward controlling the pink bollworm through cultural methods, more efficient practices and better compliance with recommendations are needed on the part of growers and ginners.

Guthion, used experimentally for several years, is highly effective against this insect, Martin said. He also reported: "Sevin, a new insecticide tested in the field for the first time in 1957, appears

very promising. Methoxychlor, Dilan and EPN have long been known to be effective but have not proved competitive with DDT because of cost or other reasons. Several promising compounds are being tested in the field and laboratory at the present time."

#### **LIQUID 'ARASAN' 42-S DEVELOPED BY DUPONT**

The first commercial liquid suspension of thiram, for slurry treatment of seed and for use as a paint or spray repellent against rodents, rabbits, deer and birds, has been developed by DuPont Co. Thiram is tetramethyl thiram disulfide.

Called Arasan 42-S seed disinfectant and protectant, the product is a stable suspension of fine particles of thiram, containing four pounds of active material per gallon of product.

For slurry treatment it is used at rates ranging from 2¼ pints to 11 pints per gallon of water.

Arasan 42-S will be sold in one- and five-gallon drums.

#### **FUNGICIDE DEVELOPMENT DISCUSSED AT AIBS MEET**

Modern methods for commercial development of agricultural fungicides were reviewed recently in an address by Dr. R. H. Wellman, manager, Crag Agricultural Chemicals, Union Carbide Chemicals Co., at the convention of the American Institute of Biological Sciences, Indiana University, Bloomington.

Greatest change in the field of fungicidal development is today's emphasis on teamwork, Dr. Wellman declared. "Workers in chemical companies now have close liaison with those in state and federal experiment stations, and with grower organizations, food processors and, in some instances, with large growers themselves."

Dr. Wellman described in detail the many problems faced by the industry in finding and producing better fungicides. He estimated that a company must spend more than \$1.25 million to research and prepare a fungicide for the commercial market.



**INSECTICIDE TESTS**—Work at the USDA's Pink Bollworm Center, Brownsville, Tex., includes testing of experimental insecticides. Potted cotton plants in cages enable C. H. Tsao (left) and A. J. Chapman, assistant station leader, to check kill of various insecticides. After an insecticide shows promise in laboratory tests, it undergoes extensive field tests. DDT, currently the only insecticide recommended for pink bollworm control, continues to be the most economical. Sevin, a new insecticide tested in the field for the first time in 1957, appears very promising.



## Statistics

### CALIFORNIA FERTILIZER SALES SEPTUPLD SINCE '30

According to a report from the California Fertilizer Association, sales of fertilizer in the state have increased more than seven times since 1930:

Sales	Tons
1930.....	156,877
1940.....	218,589
1950.....	640,050
1957.....	1,105,453

### KY. JUNE FERT. SALES WAY ABOVE LAST YEAR

Sales in Kentucky of all but two grades of mixed fertilizers increased during June, 1958, when compared with June, 1957. Total mixed fertilizer sales in the state this June reached 32,443 tons, 13,428 tons above the 19,015 tons sold during June, 1957.

Leading grade was 5-10-15 (7,920 tons) followed by 4-12-8 (5,949 tons) and 6-12-12 (3,605 tons).

June 1958 fertilizer materials sales in Kentucky totaled 8,101 tons, more than double the 3,848 tons sold in June of last year.

## PESTICIDE EXPORTS INCREASE 8.5 PER CENT

Exports of pesticidal materials for the January-April period were \$30,390,528, an increase of 8.5 per cent in value as compared with the same period in 1957, reports the U. S. Department of Commerce in *Chemical and Rubber Industry Report*.

One of the largest increases, that in DDT (19.1 per cent) is attributed largely to procurement programs of the International Cooperation Administration and World Health Organization.

Four-month export totals for the various categories of pesticides are as follows:

Commodity	Value <sup>1</sup> (In thousand dollars)
Nicotine sulfate, 40 per cent basis.....	22.4
Copper sulfate, normal and basic.....	532.8
Lead arsenate.....	129.2
Calcium arsenate.....	22.4
Pyrethrum extract.....	71.6
Paradichlorobenzene.....	138.8
DDT, technical.....	1,057.5
DDT formulations containing 20-74 per cent DDT.....	459.6
DDT formulations containing 75 per cent or more DDT.....	5,673.8
Benzene hexachloride, tech., and formulations containing 6 per cent or more gamma isomer of BHC.....	257.3
Herbicides, 2,4-D and 2,4,5-T as parent acid.....	1,549.7
Herbicides, n.e.c. <sup>2</sup> .....	1,943.3
Agricultural sulfur (except formulations), n.e.c. <sup>2</sup> .....	101.0
Organic phosphate insecticides, technical, and insecticide concentrates and formulations of 15 per cent or more organic phosphates, n.e.c. <sup>2</sup> .....	1,100.2
Polychlor insecticides, technical and insecticide concentrates and formulations of 15 per cent or more polychlors, n.e.c. <sup>2</sup> .....	7,639.4
Agricultural insecticides and insecticide formulations, n.e.c. <sup>2</sup> .....	4,179.2
Fungicides.....	2,450.6
Fumigants, soil, grain, and industrial.....	369.6
Insecticides and other pesticides, household and industrial, n.e.c. <sup>2</sup> .....	1,612.0
Disinfectants.....	1,080.3

<sup>1</sup> As figures were rounded, the value will not exactly equal the total indicated in the text.

<sup>2</sup> Not elsewhere classified.

## Production—June, 1958

Compiled from Government Sources

Chemical	Unit	June		May
		1958	1957	1958
Ammonia, synth. (anhydrous).....	s. tons	336,309	308,755	348,158
Ammonia, byproduct liquor (NH <sub>3</sub> content).....	s. tons	1,052	*1,396	1,066
Ammoniating solutions (incl. urea ammoniating sol.)				
100% N.....	s. tons	135,429	—	*68,461
Ammonium nitrate, fert. grade (100% NH <sub>4</sub> NO <sub>3</sub> ).....	s. tons	139,007	164,787	167,122
Ammonium sulfate				
synthetic (technical).....	s. tons	97,917	91,998	104,410
byproduct.....	s. tons	49,328	*77,412	49,198
BHC (Hexachlorocyclohexane).....	pounds	5,318,094	5,092,137	5,245,581
Gamma content.....	pounds	873,766	840,993	831,446
Copper sulfate (gross).....	s. tons	4,080	6,632	4,912
DDT.....	pounds	12,172,548	11,023,156	12,184,886
2,4-D acid.....	pounds	1,797,585	3,061,244	2,272,995
esters and salts.....	pounds	1,663,680	**1,686,123	3,060,422
esters and salts (acid equiv.).....	pounds	1,251,946	**1,351,002	2,267,298
Phosphoric acid (100% P <sub>2</sub> O <sub>5</sub> ).....	s. tons	139,295	119,918	153,199
Sulfur, native (Frasch).....	l. tons		439,513	400,957
recovered.....	l. tons		44,867	63,737
Sulfuric acid, gross (100% H <sub>2</sub> SO <sub>4</sub> ).....	s. tons	1,216,192	1,314,945	1,309,774
Superphosphate and other phos. materials (100% APA).....	s. tons	172,619	171,821	*232,805
normal and enriched (100% APA).....	s. tons	80,786	83,506	*127,148
concentrated (100% APA).....	s. tons	67,318	68,350	78,093
ammonium phosphates (100% APA).....	s. tons	15,282	14,549	15,128
other phos. ferts. (incl. wet-base goods) (100% APA).....	s. tons	9,233	5,416	12,436
2,4,5-T acid.....	pounds	564,333	**603,237	506,899
Urea (total primary production).....	pounds	78,089,577	71,619,423	90,497,304

\* Revised. \*\* Partly estimated. <sup>1</sup> Includes quantities for 1 plant previously not reporting.



# PEST REPORTS

## CORN DAMAGED IN SEVERAL AREAS

**Corn earworm** moth activity increased heavily in late August in New Jersey. Trap catches during the week ending August 22 were several times those of the previous week. In Maryland the worms were on the increase on both sweet and field corn and were expected to be serious on late corn. However, the pest was light on soybeans. One hundred per cent infestation was reported on late sweet corn ears in the Eastern Shore counties of Virginia. Up to 7 per cent of the whorls of field corn were damaged in Iredell County, North Carolina—the heaviest damage in recent years.

The corn earworm damaged grain sorghums in central and northern Alabama, in parts of Arkansas and Lea County, New Mexico. In the latter state corn ears were destroyed. Moth flights increased in Wisconsin during late August and damage was expected to late sweet corn. Iron County, Utah, had infestations in corn from 88–89 per cent with heavy infestations in most southern localities of the state checked. Scattered damage was reported from Torrington, Goshen County, Wyoming but sweet corn in the Aberdeen, Idaho, area had 100 per cent infestation with many ears having 2 larvae. Infestations in the mid-Willamette Valley of Oregon were heavier than in 1957 and losses as high as 7 per cent ear weight on graded samples were recorded. Yakima Valley, Washington, recorded the heaviest damage from the corn earworm in the past 12 years. On July 26, 900 moths were caught compared with 10 for similar time and place in past years. The insect was also heavy on corn in

the Walnut Grove area of Sacramento County, California.

**The European corn borer** during the latter part of August was causing damage in some areas. In New Jersey, although not generally heavily, late plantings of field corn were damaged. Some damage was reported from the Eastern Shores of both Maryland and Virginia. Johnston County, North Carolina, was found infested for the first time in August and heavy flights were under way the latter part of the month in northern Alabama. Although populations varied throughout Arkansas one field of grain sorghum in Phillips County had 25 per cent of the heads broken over.

Egg mass counts of the European corn borer in southwestern Missouri ranged from 20–200 per 100 stalks. Larvae were found in nearly all of the corn fields examined in 7 east central and 7 northeast Kansas counties. By the middle of August, egg mass counts on field corn reached or exceeded 100 per 100 plants in 10 per cent of the fields in Boone County, Iowa. Egg masses averaged 92 per 100 plants in field corn in north central Illinois. Although populations varied widely in Wisconsin and moth flights were continuing into late August in four western counties parasitism had killed 25 per cent of the larvae. Predation was responsible for a high incidence of larvae kill in the Wooster, Ohio, area. Due to late first generation development in Minnesota it is not expected that the second generation will cause much damage although in the Fargo area of North Dakota some heavy infestations were in sweet corn. Larvae counts in southeastern South Da-

*Presented in cooperation with  
the Economic Insect Survey  
Section, Plant Pest Control  
Branch, Agricultural Research  
Service, USDA.*

kota averaged 288 per 100 plants and 130 in the south central area.

**Fall armyworms** continued damaging corn in late August in parts of New Jersey, Delaware, Maryland and Virginia. Grain sorghum in central and north Alabama suffered considerable damage from the insect and in northern Louisiana young corn was 100 per cent infested. Populations averaged 1 to 2 per young corn plant in Mississippi County, Arkansas. Populations were also reported from parts of Georgia, Oklahoma and Ohio.

**The southwestern corn borer** caused heavy damage in corn in localized areas of New Mexico and Louisiana and was found in corn for the first time in Desha County, Arkansas.

**Spotted alfalfa aphid** counts in general were low, although some increases were reported. The only areas reporting controls necessary in late August were Washington and Millard Counties, Utah. Continuing to spread in the east was the **alfalfa weevil**, which has been reported from Rhode Island for the first time.

Although in general fruit pests were relatively light in late August some damage was still being experienced. **Mites** were the principal concern with some damage being reported from Massachusetts. Heavy populations were reported from parts of Colorado, Utah, Washington, Oregon and New Mexico.

In the Vincennes, Indiana, area **codling moth** injury in August in commercial orchards was the lightest recorded in 8 years. Infestations were also low in Ohio orchards. The insect was locally severe in Iron, Washington and Millard, Utah, apple orchards and reported as medium on walnut trees in Riverside, Riverside County, California.

Among truck and vegetable

## Grasshopper Fight in 10 States Cuts Crop Damage

insects, **cabbageworms** were perhaps the most active in late August. In localized areas of Oregon broccoli and cauliflower carried heavy infestations. Populations of the loopers, up to 8 per cabbage head, were reported from Orange County, California. Young cauliflower in the same area had an infestation of 2 to 5 per plant. Young lettuce in Dona Ana County, New Mexico, had medium to heavy infestations. Infestations in eastern Virginia were such that in August it was predicted that this might be the worst looper year experienced in the eastern part of the state. Counts averaged 5 to 6 per cucumber leaf in the Virginia Eastern Shore counties.

**Flea beetles** caused heavy damage to potatoes in Smith Valley, Lyon County, Nevada, and controls were necessary on potatoes in Garfield County, Colorado. Heavy localized populations were also reported from Utah, Virginia, Delaware and Massachusetts. Damaging populations of the **Mexican bean beetle** were reported in late August from Wyoming, Utah, Alabama and Delaware.

Among the cotton insects **bollworms** were still very important during late August. Populations in South Carolina were still on the increase with the build up the worst in several years. Infestations were on the increase in Alabama with 50 to 75 per cent of the young terminals in Madison County being damaged by young larvae. Larvae were present in most west Tennessee cotton fields with large bolls being damaged. Moths were emerging in large numbers in Arkansas and eggs were being found on all parts of the cotton plant. Controls were being applied for the cotton bollworm in several Missouri Counties and untreated Oklahoma fields averaged 3 per cent infested bolls. Heavy egg deposition was recorded in the Mississippi delta counties and infestation ranged up to 8 per cent in some Louisiana Parishes. ▲

**S**PRAYING of nearly 5 million acres against grasshoppers in 10 western states has prevented significant damage from the insects to wheat and other small grain crops, USDA reports. Rangeland, idle lands and roadsides were sprayed by planes and ground equipment in the cooperative federal-state rancher program in these states to fight the largest grasshopper outbreak since 1949.

*Because the insects were killed before many could migrate to crops, wheat and other small-grain crops suffered little or no damage. However, later migrations caused some damage to row crops.*

A second generation of grasshoppers could cause severe marginal damage to fall wheat in some areas unless farmers take preventive measures, USDA entomologists warned.

An early September report said the cooperative federal-state rancher program was about completed. Surveys now in progress will record the intensity and location of remaining grasshopper populations and determine areas which should be watched carefully in 1959.

Treated areas included 138,500 acres in Arizona, 2,761,600 in Colorado, 53,500 in Idaho, 248,800 in Kansas, 97,600 in Montana, 41,000 in Nebraska, 148,200 in New Mexico, 237,000 in Okla-

homa, 924,000 in Texas and 274,800 in Wyoming. Croplands treated by farmers—in addition to the cooperative program—are not included in these acreages.

More than 87 per cent of the treated land lies in the lower Great Plains; in Colorado, Kansas, New Mexico, Oklahoma and Texas. The areas in greatest danger of grasshopper attack were included in this year's program. Remaining infestations will be carefully watched and given attention if they become critical next year.

In the 5-state area, the campaign kept some 200 workers (including 93 USDA specialists), 130-odd vehicles, and more than 100 airplanes at work spraying 41½ million gallons of mixed insecticides at an overall cost of about \$2 million. USDA bears about one-third of the cost of such cooperative programs, with state and local agencies and ranchers sharing the other two-thirds of the expense.

A spray of two ounces of either heptachlor or aldrin applied in one gallon of diesel oil per acre controls all species of grasshoppers under most conditions. One application of these insecticides this year continued to control late-hatching grasshoppers and in some cases remained effective against the second and third invasions of adult grasshoppers.



AS NYMPHS, the grasshoppers start their destructive feeding. After their wings develop, they may take to the air in swarms. This field worker is stirring up a swarm containing both nymphs and adults.

USDA Photo

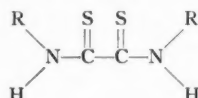
FARM CHEMICALS

## Patent Reviews

FC

### PLANT GROWTH REGULANTS

U.S. 2,837,417, issued June 3, 1958 to John R. Fisher and assigned to The Dow Chemical Co., discloses the use as plant growth regulants of dithiooxamides of the formula



where R is alkyl (C 2-6). These compounds may be used for their herbicidal effect, or to accelerate the maturing of the crop.

### SPLIT CIRCUIT POTASH ORE FLOTATION CONCENTRATION

U.S. 2,836,297, issued May 27, 1958 to William A. Smith, Vernon L. Mattson and Gene Meyer, assigned to The American Metal Company, Ltd., relates to the froth flotation of sylvite from potash ores.

It has been found that the tendency for sylvite-containing potash ores to consume an inordinate amount of a cationic collector is to a considerable extent due to the tendency of the finer particles of the ore as customarily prepared for the flotation treatment to consume a much larger proportion of the collector than is necessary for a satisfactory flotation result. At the same time it is found that the lower molecular weight collections, e.g. shorter chain amines, will by themselves sufficiently condition the finer particles for a flotation operation so that it is not necessary that such fine particles shall have attached to them any of the more expensive higher molecular weight collectors. On the other hand, the lower molecular weight collectors are generally not sufficiently effective to prepare the coarser particles of the ore feed for a flotation treatment.

It has also been found that if the ore for the flotation feed, after appropriate crushing or grinding

is screened or otherwise classified into fine and coarser fractions and these fractions are separately conditioned with appropriate collecting agents, it is possible to obtain a satisfactory flotation result with a much smaller overall quantity of the collecting agent or agents than has heretofore been considered necessary.

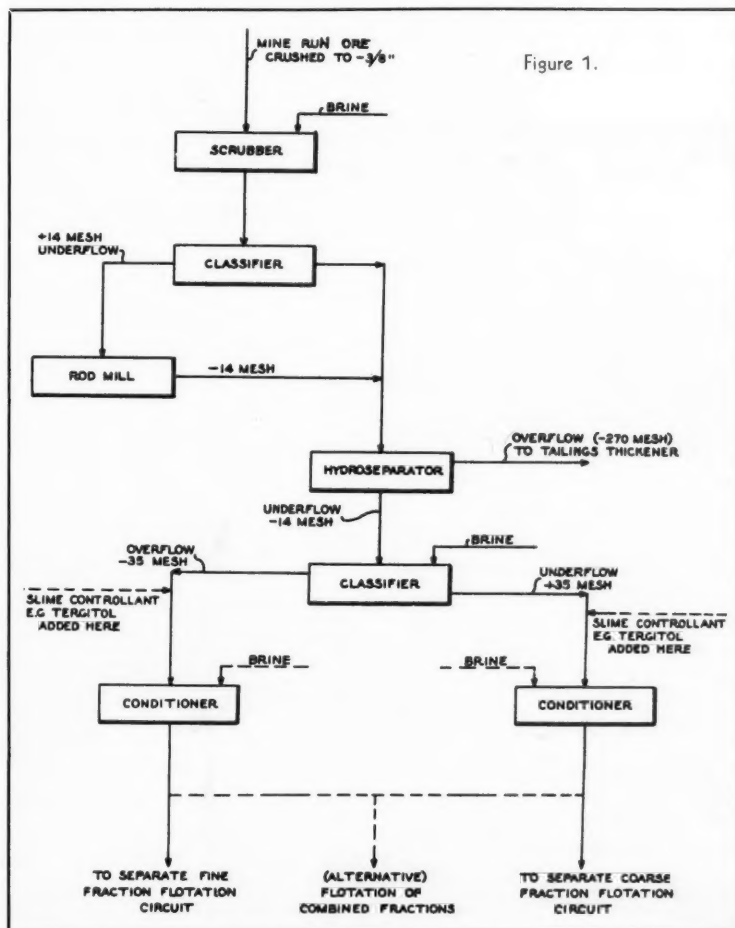
Besides the reagent economies that are made possible by separating the feed into a finer and a coarser fraction and separately conditioning the two fractions, it has been found that further advantages are realized when the preparation of the ore feed for the flotation operation, i.e. the separation of the feed into a number of fractions according to

particle size, is so regulated as to produce a coarse fraction where the particles are of a size range that is so selected as to increase the separation of the sylvite particles from the halite or gangue particles of the ore according to their difference in particle size during the preparation steps of the process. In this way the amount of processing of the coarser fraction in the flotation cells may be reduced and the scrubbing and mechanical desliming steps required to render the coarser fraction amenable to flotation may be materially reduced.

Fig. 1 shows a flowsheet of the process.

### NEMATOCIDE

U. S. 2,833,687, issued May 6, 1958 to W. E. Craig and John O. Van Hook, assigned to Rohm & Haas Co., provides a new nematocide, namely 2,2,2-trichloro-1-cyanoethyl acetate. It may be





## Patents

applied to the soil either in bulk or emulsified in water.

### FUNGICIDES

**U. S. 2,833,689**, issued May 6, 1958 to Henry J. Gerjovich and assigned to E. I. du Pont de Nemours & Co., discloses the use as a fungicide of the lower aliphatic esters of benzothiazole, benzoxazole carbamic, and thio-carbamic acids.

**U.S. 2,839,444** issued June 17, 1958 to Waldo B. Ligett and Alfred J. Kolka, assigned to Pittsburgh Coke & Chemical Co., discloses the use as a fungicide of 2,4-dinitrofluorobenzene.

### HERBICIDES

**U. S. 2,833,639**, issued May 6, 1958 to Keith C. Barrons and John D. Eastman, assigned to The Dow Chemical Co., describes a method for the control of many undesirable weeds in large seeded crop plantings by treating the planted soil with a 2,4-dinitro-6-

lower-alkyl-phenol or its water-soluble salt before crop emergence.

It has now been found that the treatment with an alkali of the soil surface of an area previously planted with a large seeded crop materially reduces potential injury and stunting of the crop from the desired dinitrophenolics applied in aqueous dispersion to the same surface area.

### TREATMENT OF PERISHABLE AGRICULTURAL PRODUCTS

**U. S. 2,833,656**, issued May 6, 1958 to Arthur F. Kalmar and Hugh F. Fitzpatrick, assigned to Food Machinery & Chemical Corp., relates to means for sterilizing and immunizing fruit and vegetables to protect them from the decaying effects of molds and bacteria.

Under certain conditions, a solution or orthophenylphenate and hexamine, which is used for this purpose, may rapidly be converted into compounds which have no appreciable germicidal or fungicidal effect so that fruit treated with it will be left without protection.

This can be prevented by adding to the solution an alkali or alkali buffer in sufficient quantity to maintain the solution at a pH above 11.

### MIXED FERTILIZERS PROCESS

**U.S. 2,837,418**, issued June 3, 1958 to James E. Seymour and assigned to Central Farmers Fertilizer Co., describes a process for manufacturing mixed fertilizers in such a manner that the product is substantially dry, completely reacted, and fully granulated so that no separate granulating or curing steps are required.

In general, this is accomplished by employing calcium, potassium, or sodium meta-phosphate, and hydrolyzing it in the presence of a strong mineral acid to convert it to the corresponding primary orthophosphate. This, in turn, is partially or completely acidulated by the acid. The resulting reaction mixture is then completely neutralized by means of an ammoniating agent.

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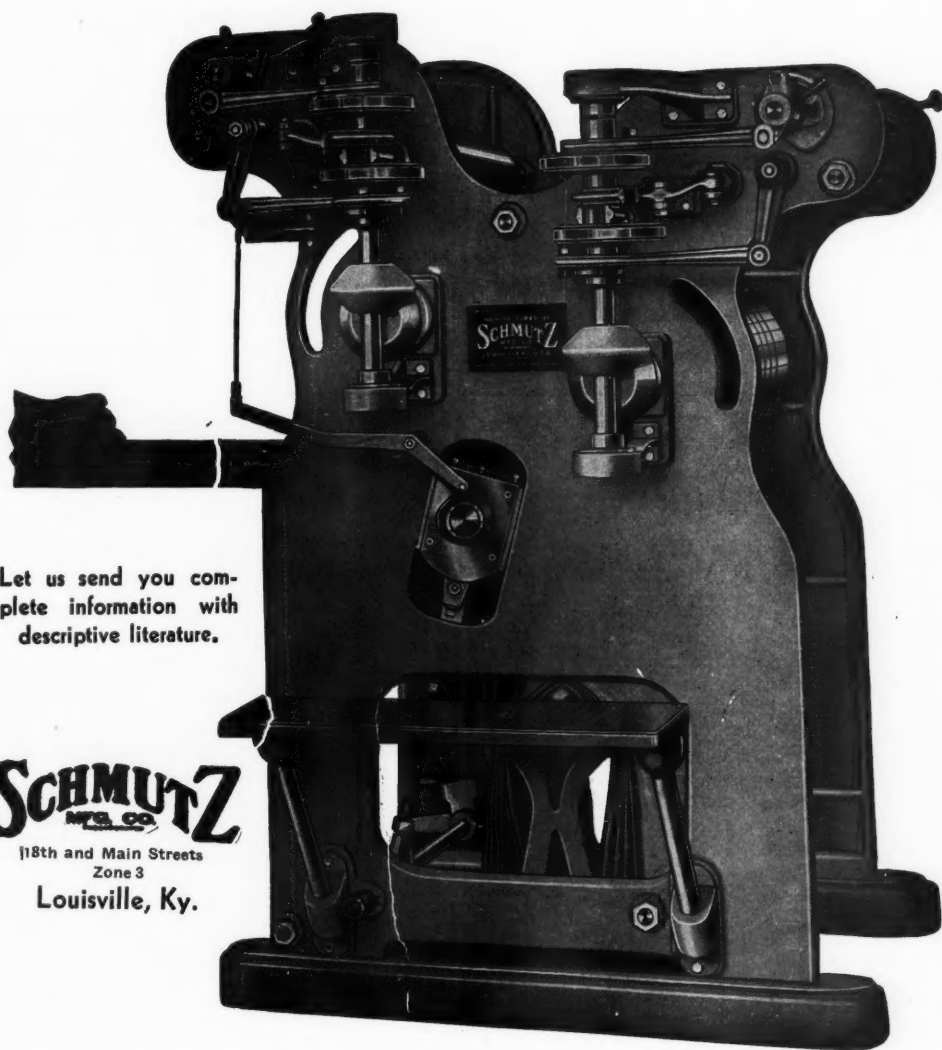
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Sturtevant Mill Co., Boston, Mass.

## MACHINERY—Mixing, Screening and Bagging

Poulsen Co., Los Angeles, Calif.  
Stedman Foundry and Machine Co., Aurora, Ind.  
Sturtevant Mill Co., Boston, Mass.

## MACHINERY—Power Transmission

Stedman Foundry and Machine Co., Aurora, Ind.

## MACHINERY

### Superphosphate Manufacturing

Stedman Foundry and Machine Co., Aurora, Ind.  
Sturtevant Mill Co., Boston, Mass.

## MALATHION

American Cyanamid Co., New York City

## MANGANESE SULFATE

Tennessee Corp., Atlanta, Ga.

## MANURE SALTS

Potash Co. of America, Washington, D. C.

## METHOXYCHLOR

Geigy Agr. Chems., Div. Geigy Chem. Corp. N.Y.C.

## MINOR ELEMENTS

Geigy Agr. Chems., Div. Geigy Chem. Corp. N.Y.C.  
Tennessee Corporation, Atlanta, Ga.

## MIXERS

Stedman Foundry and Machine Co., Aurora, Ind.  
Sturtevant Mill Co., Boston, Mass.

## NITRATE OF SODA

Allied Chemical Corp., Nitrogen Div., N.Y.C.  
American Cyanamid Co., New York City  
Armour Fertilizer Works, Atlanta, Ga.  
Ashcraft-Wilkinson Co., Atlanta, Ga.  
Bradley & Baker, N. Y. C.  
International Min. & Chem. Corp., Skokie, Ill.  
Woodward & Dickerson, Inc., Philadelphia, Pa.

## NITROGEN SOLUTIONS

Allied Chemical Corp., Nitrogen Div., N. Y. C.  
American Cyanamid Co., New York City  
Ashcraft-Wilkinson Co., Atlanta, Ga.  
Commercial Solvents Corporation, New York City  
E. I. duPont de Nemours & Co., Wilmington, Del.  
Escambia Chem. Corp., Pensacola, Fla.  
Mississippi River Chem. Co., St. Louis, Mo.  
Phillips Chemical Co., Bartlesville, Okla.  
Sinclair Chemicals, Chicago, Ill.  
Sohio Chemical Co., Lima, O.  
The Texas Co., New York City

## NITROGEN MATERIALS—Organic

American Agricultural Chemical Co., N. Y. C.  
Armour Fertilizer Works, Atlanta, Ga.  
Ashcraft-Wilkinson Co., Atlanta, Ga.  
Bradley & Baker, N. Y. C.  
International Min. & Chem. Corp., Skokie, Ill.  
Jackle, Frank R., New York City  
Woodward & Dickerson, Inc., Philadelphia, Pa.

## NOZZLES—Spray

Monarch Mfg. Works, Philadelphia, Pa.  
Spraying Systems Co., Bellwood, Ill.

## PAILS—STEEL

Vulcan Containers, Inc., Bellwood, Ill.

## PARATHION

American Cyanamid Co., New York City  
Ashcraft-Wilkinson Co., Atlanta, Ga.

## PHOSPHATE ROCK

American Agricultural Chemical Co., N. Y. C.  
American Cyanamid Co., New York City  
Armour Fertilizer Works, Atlanta, Ga.  
Ashcraft-Wilkinson Co., Atlanta, Ga.  
Bradley & Baker, N. Y. C.  
International Min. & Chem. Corp., Skokie, Ill.  
Woodward & Dickerson, Inc., Philadelphia, Pa.

## PHOSPHORIC ACID

American Agricultural Chemical Co., N. Y. C.  
Allied Chemical Corp., General Chemical Div., N. Y. C.

## PLANT CONSTRUCTION—Fertilizer and Acid

Stedman Foundry and Machine Co., Aurora, Ind.  
Sturtevant Mill Co., Boston, Mass.

## POTASH—Muriate

American Potash & Chemical Corp., Los Angeles, California  
Ashcraft-Wilkinson Co., (Duval Potash) Atlanta, Ga.  
H. J. Baker & Bro., N. Y. C.  
Bradley & Baker, N. Y. C.  
Duval Sulphur & Potash Co., Houston, Tex.  
International Min. & Chem. Corp., Skokie, Ill.  
Potash Co. of America, Washington, D. C.  
Southwest Potash Corp., New York City  
United States Potash Co., N. Y. C.

## POTASH—Sulfate

American Potash & Chemical Corp., Los Angeles, California  
International Min. & Chem. Corp., Skokie, Ill.  
Potash Co. of America, Washington, D. C.

## PRINTING PRESSES—Bag

Schmutz Mfg. Co., Louisville, Ky.

## PYROPHYLLITE

Ashcraft-Wilkinson Co., Atlanta, Ga.

## REPAIR PARTS AND CASTINGS

Stedman Foundry and Machine Co., Aurora, Ind.

## RESPIRATORS

Flexo Products Inc., Westlake, Ohio

## SCALES -Including Automatic Baggers

Stedman Foundry and Machine Co., Aurora, Ind.

## SHOVEL LOADERS

Clark Equipmt. Co., Benton Harbor, Mich.  
Hough, The Frank G. Co., Libertyville, Ill.  
Tractomotive Corp., Deerfield, Ill.

## SLUDGE

H. J. Baker & Bro., New York City

## SPRAYS

Baughman Mfg. Co., Jerseyville, Ill.  
Monarch Mfg. Works, Inc., Philadelphia, Pa.  
Spraying Systems Co., Bellwood, Ill.

## SPREADERS—TRUCK

Baughman Manufacturing Co., Jerseyville, Ill.  
Highway Equipment Co., Cedar Rapids, Iowa

## SULFATE OF AMMONIA

Allied Chemical Corp., Nitrogen Div., N. Y. C.  
American Agricultural Chemical Co., N. Y. C.  
American Cyanamid Co., New York City  
Armour Fertilizer Works, Atlanta, Ga.  
Ashcraft-Wilkinson Co., Atlanta, Ga.  
H. J. Baker & Bro., N. Y. C.  
Bradley & Baker, N. Y. C.  
Phillips Chemical Co., Bartlesville, Okla.  
Woodward & Dickerson, Inc., Philadelphia, Pa.

## SULFATE OF POTASH—MAGNESIA

International Min. & Chem. Corp., Skokie, Ill.

## SULFUR

Ashcraft-Wilkinson Co., Atlanta, Ga.  
Texas Gulf Sulphur Co., New York City  
Woodward & Dickerson, Inc., Philadelphia, Pa.

## SULFUR—Dusting & Spraying

Ashcraft-Wilkinson Co., Atlanta, Ga.  
U.S. Phosphoric Products Div., Tennessee Corp., Tampa, Fla.

## SULFURIC ACID

Allied Chemical Corp., General Chemical Div., N. Y. C.  
American Agricultural Chemical Co., N. Y. C.  
Armour Fertilizer Works, Atlanta, Ga.  
Ashcraft-Wilkinson Co., Atlanta, Ga.  
Bradley & Baker, N. Y. C.  
International Min. & Chem. Corp., Skokie, Ill.  
Tennessee Corp., Atlanta, Ga.  
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

## SUPERPHOSPHATE

American Agricultural Chemical Co., N. Y. C.  
Armour Fertilizer Works, Atlanta, Ga.  
Ashcraft-Wilkinson Co., Atlanta, Ga.  
H. J. Baker & Bro., N. Y. C.  
Bradley & Baker, N. Y. C.  
International Min. & Chem. Corp., Skokie, Ill.  
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.  
Woodward & Dickerson, Inc., Philadelphia, Pa.

## SUPERPHOSPHATE—Concentrated

American Cyanamid Co., New York City  
Armour Fertilizer Works, Atlanta, Ga.  
H. J. Baker & Bro., N. Y. C.  
Bradley & Baker, N. Y. C.  
International Min. & Chem. Corp., Skokie, Ill.  
Phillips Chemical Co., Bartlesville, Okla.  
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.  
Woodward & Dickerson, Inc., Philadelphia, Pa.

## TALC

Ashcraft-Wilkinson Co., Atlanta, Ga.

## TANKAGE

American Agricultural Chemical Co., N. Y. C.  
Armour Fertilizer Works, Atlanta, Ga.  
Ashcraft-Wilkinson Co., Atlanta, Ga.  
H. J. Baker & Bro., N. Y. C.  
Bradley & Baker, N. Y. C.  
International Min. & Chem. Corp., Skokie, Ill.  
Woodward & Dickerson, Inc., Philadelphia, Pa.

## TANKS-FIBERGLASS

Hanson Equipment Co., Beloit, Wis.

## TOXAPHENE

Ashcraft-Wilkinson Co., Atlanta, Ga.

## TRUCKS—SPREADER

Baughman Mfg. Co., Jerseyville, Ill.  
Highway Equipment Co., Cedar Rapids, Iowa

## UREA & UREA PRODUCTS

Allied Chemical Corp., Nitrogen Div., N. Y. C.  
H. J. Baker & Bro., N. Y. C.  
Bradley & Baker, N. Y. C.  
E. I. duPont de Nemours & Co., Wilmington, Del.  
Grand River Chem. Div., Deere & Co., Tulsa, Okla.  
Sohio Chemical Co., Lima, O.

## UREA-FORM

E. I. duPont de Nemours & Co., Wilmington, Del.

## VALVES

Monarch Mfg. Works, Inc., Philadelphia, Pa.

## ZINC SULFATE

Tennessee Corp., Atlanta, Ga.

## FARM CHEMICALS

## Progress Report

### POTASH COMPANY OF AMERICA, LTD.

Early completion of our Saskatoon plant will make it possible to provide a level of customer service not approached by any other company.

Watch for announcement of our start-up time.

Meanwhile our Carlsbad Plant can serve your entire POTASH requirements with the very best material.

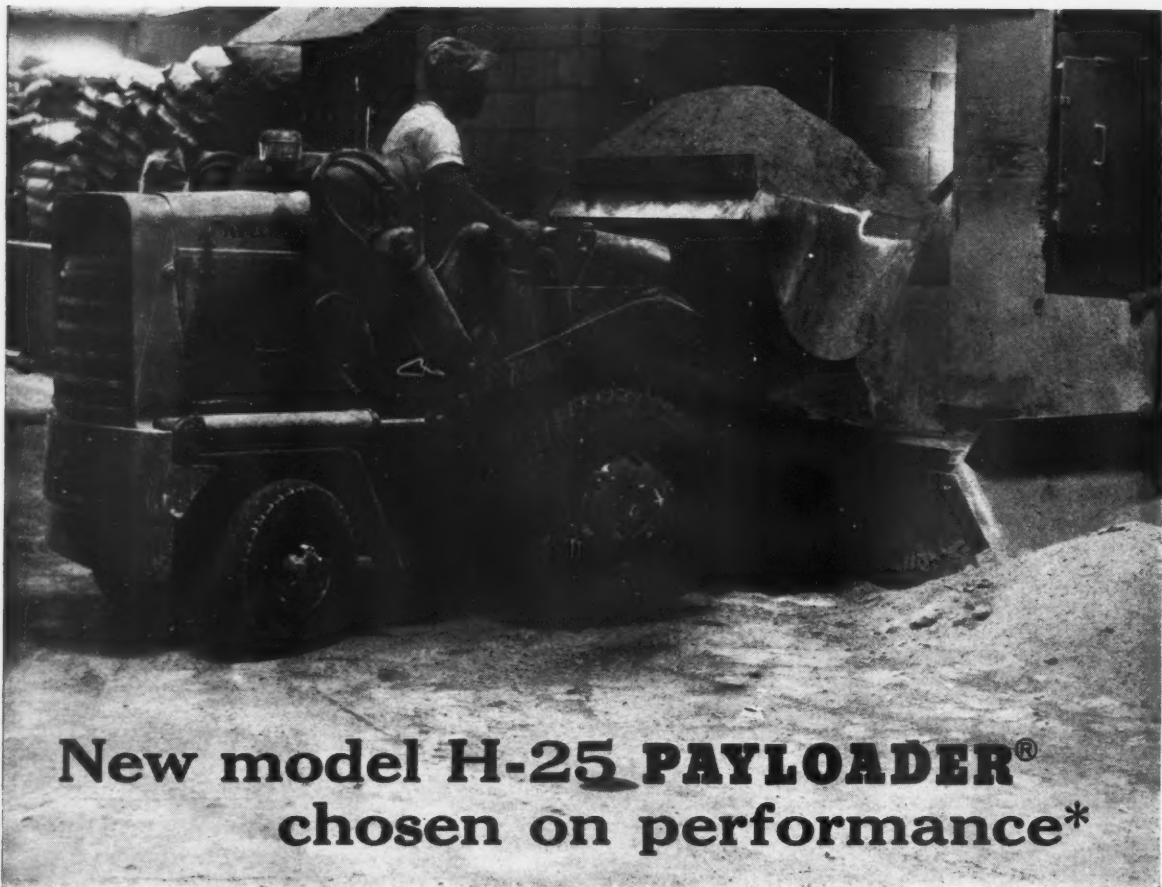
New 60% Standard Muriate  
New 60% Special Granular Muriate  
New 60% Coarse Granular Muriate  
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Chemical Muriate—99.9% KCL minimum

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Midwestern Sales Office . . . First National Bank Bldg., Peoria, Ill.  
Southern Sales Office . . . Candler Building, Atlanta, Ga.



## New model H-25 PAYLOADER® chosen on performance\*

**\*Chase and Company Fertilizers staged competitive trials** when it needed a tractor-shovel for its new Sanford, Florida plant. Instead of listening to a lot of claims, it had competitive sizes brought in and tested side-by-side. One of the new model H-25 "PAYLOADER" units won the trials, and Mr. Carson Cook, Assistant Plant Manager, summarizes the verdict in favor of the H-25 as "more capacity, better maneuverability, and easier operation due to Hough power-shift transmission and power-steering."

We say that "PAYLOADER" tractor-shovels give you more performance for your money, and we mean it, but we prefer to let owners say it for us or let them prove it on their own job conditions as did Chase and Company Fertilizers.

When it comes to moving bulk materials economically, the H-25 is in a class by itself. Its carry capacity of 2,500 lbs. alone is an achievement for its size . . . and it is the only tractor-shovel in its range that boasts a power-shift transmission with two speeds forward *and* two speeds reverse.

Other model H-25 "exclusives" in its class are power-steer and power-transfer differential. The latter gives more reliable traction under slippery conditions by automatically shifting more power to the wheel with the better traction.

Other "extras" that are standard on the H-25 are bigger, more powerful engines (gas or diesel available) and the most complete system of air-filters, oil filters and oil and grease seals to protect working parts against dust and dirt.

If you want to find out about all the other advantages of the H-25 "PAYLOADER" and its ability to handle more tonnage at lower cost consult your Hough Distributor. Ask him about Hough Purchase and Lease Plans, too.

### THE FRANK G. HOUGH CO.

704 Sunnyside Ave., Libertyville, Ill.

☐ Send complete data on the H-25 PAYLOADER

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Title \_\_\_\_\_

Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

10-A-3



Modern Materials Handling Equipment

**THE FRANK G. HOUGH CO.**

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